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BULBS:

A TREATISE ON



HARDY AND TENDER BULBS AND TUBERS.

BY

EDWARD SPRAGUE RAND, JR.,

Author of "Flowers for the Parlor and Garden," "Garden Flowers," &c.

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To

DR. WILLIAM R. LAWRENCE,

THIS VOLUME

IS CORDIALLY INSCRIBED.

INTRODUCTION.

THE plants of which the present volume treats are among the most beautiful in the floral kingdom. While comparatively few are indigenous to Northern climes, and many are natives of the torrid zone, most of them may be grown with but a slight outlay; and the garden, frame, and greenhouse may be gay at every season of the year with their gorgeous blossoms.

Many of them are also admirably suited for window-culture, and, though generally not ornamental in foliage, flower freely in the parlor, and stand well the heat of furnaces, and the poisonous gas which impregnates the air wherever gas is used for lighting. During their period of growth, which is the season at which they are generally in the parlor, they will bear any quantity of water; and therefore one of the great mistakes in parlor-culture — over-watering — cannot be committed.

Most of those ordinarily grown in the parlor bloom

in winter, and, in summer, need only to be dried off in a cellar or on a closet-shelf.

They are subject to few diseases, and insects seldom attack them. All these are great recommendations; and when we add that the blossoms are not only very showy, but, in many species, also delightfully fragrant, we have said enough to cause them to be generally cultivated.

In the garden, also, they play an important part; beginning to bloom with the early snowdrop, which looks out with timid eyes upon the storms of February; and ending only with the adventurous colchicum, which, heedless of fading leaves and frowning skies, thrusts up its delicate blossoms of purple or white in the short November days, as if to bid a farewell to the dying year.

The culture of bulbs is yet in its infancy. As a class, these plants are every year attracting more attention; and the time is not far distant when the skill of the hybridist and the researches of collectors will greatly increase our number of species and varieties.

If we may take the hyacinth for an instance, where, from a single original species, all the numberless forms now in cultivation have been derived, or, what

are, perhaps, better examples, the amaryllis and gladiolus, where a few species have produced countless varieties, most of which excel any of the parents in beauty, we see how wide a field is open; while, at the same time, it is impossible to predict the result, or to imagine the improvements, which the future may witness, or the beauty which may be born under the skilful application of systematic culture. Perhaps the most remarkable discovery in this class of plants within the last few years is the golden-banded lily (*Lilium auratum*), the beauty of which it would be difficult to describe; but we see no reason to doubt that future explorations may give us equally valuable additions, though perhaps not in the lily family. This same lily family offers a most tempting opportunity for hybridization, both from the facility with which it may be performed, and the beauty of the subjects; and in this field we may hope for great results in the future.

We must also bear in mind that many of the regions most prolific in bulbs are, as yet, imperfectly explored by botanists, and that scientific research may lead to great developments.

South Africa has probably many valuable discoveries yet to yield, and the rich fields of California and

the Pacific coast are prolific of other treasures than golden ore.

The want of a volume on this subject has long been felt by culturists. The elaborate work of Mrs. Loudon was useful in its day, though wanting in practical directions; but it has long been out of print, and its cost would render it inaccessible to the masses.

The learned treatises of Herbert can never be excelled in elaboration of detail; but they are too scientific for the popular mind, and only cover a small portion of the immense field upon which instruction is required.

It is to meet this want that the present volume has been undertaken. Its aim is to give a book of popular culture, botanically correct as far as the science of botany is within its scope, but generally adapted to popular use, and intelligible to the large class who are ardent culturists, but have little time for the study of botany; to make the culture of flowers a necessity, feeling that the inquiring mind will turn from the growing plant to study how it grows.

This volume is the third of a series of works on popular gardening; of which, two, "Flowers for the Parlor and Garden," and "Garden Flowers," are already before the public. A volume of "Orchid Culture"

is already in press; and the other volumes on "Greenhouse Flowers," "Wild Flowers," and "Ferns, Lichens and Mosses," are in preparation.

The whole, when completed, will form a library of practical culture, which the author trusts may be the means of advancing the cause of floriculture, and prove a practical benefit to horticultural science.

Many of the bulbs described as tender, and for which greenhouse treatment is directed, may prove hardy in the Middle States, and undoubtedly would in all States south of the latitude of Washington. The volume is written for the latitude of Massachusetts, and due allowance must be made by readers living either North or South. As we have often had occasion to observe, the proper application of the word "hardy" is a source of great difficulty to the horticultural writer, as the hardiness of a plant is regulated by so many circumstances other than mere temperature. In many cases, the fact can only be determined by experiment, and each must be his own judge. A volume can lay down only general rules, to which each reader may, perchance, find his own exceptions.

There is no prettier culture than that of bulbs. To watch the foliage and flower gradually developing

from the bulb is pleasing and instructive, and cannot fail to direct the thinking mind to the Author of all, who, in so many diverse and yet ever-beautiful and wondrous ways, has caused the earth to bring forth abundantly all that can minister to the wants or the gratification of man.

GLEN RIDGE, August, 1866.

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BULBS.

I.

WHAT ARE BULBS?



BOTANICALLY speaking, a bulb is an underground stem, and, though generally considered a root, partakes more of the nature of a seed.

Strictly, there are but three kinds of bulbs, — the coated, such as the hyacinth and onion, where the scales are large, and, folding around each other, form the bulb; the scaly, of which the lily is the familiar example, which consist of narrow, fleshy scales, united at the base; and the solid bulbs, or corms, such as the gladiolus and crocus, which consist of a solid, white, farinaceous mass, and which, perhaps, may be considered as a sort of rounded tuber.

In popular parlance, however, almost any solid, underground stem is called a bulb; and under this name are included many true tubers, which, in reality, possess little of the bulbous nature.

A familiar example of this is the well-known tuberose (*Polianthes tuberosa*), called a tuberose from its tuberous root, and not, as commonly conceived, from being a "rose with a tube," and a true tuber, but which is usually considered a bulb.

As we have said, the bulb partakes more of the nature of a seed ; that is, when planted, it sends forth roots into the earth, and an ascending shoot to the upper air, as a seed does in vegetation ; and, as in the case of a seed, the young plant is nourished by the starchy matter contained in the bulb, in the same manner as by that stored in the seed. The seed, however, having given birth to the plant, wastes away, and is lost ; but the bulb, to all appearance, remains the same. This latter is, in truth, not the case. Each year, the old tissue of the bulb is consumed by the plant, and replaced by new, though often in such a way that it is imperceptible to the careless eye.

A seed also sends up a stem which produces leaves and branches, or rather buds, which become developed as such ; but a bulb only sends up leaves and a flower-stem. There are, however, some bulbs which produce little bulbs, or bulblets, in the axils of the leaves.

The primary use of the bulb is to store up nourishment

for the development of the leaves and flowers. The period required to perfect this process, or, in gardeners' language, to make the bulb "strong enough to bloom," is widely different in different species, and even varies much in the same species, according to mode of growth and favorable or unfavorable circumstances.

Some bulbs and tubers require years before a sufficient stock of feculent matter is accumulated: others in a few months gain strength enough to nourish the flower. The mode by which this store is laid up is by no means different from that by which all plants assimilate to their own support the elements of earth, air, and water. It is effected by means of the roots and leaves, or foliage, and only differs in the place of deposit.

In all bulbs, tubers, and fleshy root-stalks, this nutriment is laid up in the earth, and the leaves mostly die annually, or take a season of rest: and hence we see the pertinence and force of the old gardener's adage, "Fine flowers, large leaves;" as, without a full development of foliage, it is useless to expect a perfection of bloom. Were the leaves of a bulb to be cut off as fast as they appear, the bulb would perish: therefore, if we would allow them their full action for the perfection of the bulb, they should never be cut off

until they begin to turn brown and wither, which is a sure sign the circulation of the sap has ceased; and then they will readily come away from the bulb.

As our present treatise is for popular gardening, we shall include under the general name of bulbs many true tubers, to which the general rules of bulb-culture are applicable. All bulbs require a season of rest: this takes place after the plant has produced its bloom, stored up the nourishment for the growth of the coming year, and ripened its seed. The foliage turns yellow, and falls off (except in the case of evergreen bulbs, which preserve them green, but without growth); and the bulb, save its fresh, plump appearance, preserves no sign of vitality. This season of rest varies greatly in time and duration; in some being very short, in others very long. In some, we can change it indefinitely; as gardeners say, the bulb "forces well," that is, may be forced into bloom at any season: while others "force badly;" that is, can only be had in perfection at certain seasons.

Bulbs which flower in early spring, such as crocus, Persian iris, frittelaria, snowdrop, tulip, and hyacinth, rest from June or July until October, when their roots begin to grow; but the leaves do not appear until the next

spring. Lilies go to rest immediately after flowering, and seldom grow until late in the spring, except the white lily (*L. candidum*) and its varieties, which make their growth in the autumn preparatory to blooming in early summer. Of this same nature are the many varieties of polyanthus narcissus, and iris Susiana, one of the most beautiful of the family, which in New England almost always make a fall growth, and, unless very well protected, has the young growth killed by the winter, and the bulb perishes.

Some bulbs, of which the colchicum is the best example, bloom late in the autumn, and perfect their growth of foliage and the seed the following spring. In some, as with the well-known Jacobean lily (*Sprekelia formosissima*) and Belladonna lily (*Amaryllis Belladonna*), the flower-stalk springs from the naked bulb, and the growth of leaves follows; while in others—as, for example, the tall white star of Bethlehem (*Ornithogalum pyramidale*)—the flower-stalk pushes up after the foliage has decayed.

In many bulbs, as the hyacinth and narcissus, the flower-stalk springs from the centre of the crown of leaves, on a separate stalk; in others, as in some amaryllis, it is produced from the side of the bulb, and the leaves from the top: and these two modes of growth sometimes occur in the same family.

The flower may also be upon the same stalk with the foliage, as in the well-known crown imperial (*Frittelaria imperialis*) and many other well-known bulbs. In fact, these peculiarities are infinite; and it is to these little differences that we owe much of the pleasure we derive in the culture of flowers. A new interest is constantly upspringing in the mind; and the love of Nature insensibly intertwines around the soul, until it becomes a part of our nature.

As we have seen that each bulb has its season of rest, it would follow that all bulbs should, during that season, have nothing to excite their dormant powers and to urge them to growth. With most bulbs, this is afforded by taking them out of the earth, and preserving them in a perfectly dry place, or with many bulbs grown in pots by withholding water, and "drying them off."

Bulbs which preserve an evergreen foliage are, of course, never wholly "dried off;" but water is given very sparingly, and only enough to keep the leaves from fading and the bulbs from shrivelling.

Care must always be taken, in drying off bulbs, not to dry them up, as thus many small bulbs perish. The bulbs must be kept fresh and plump, but not excited to growth. The degree of dryness each species or variety will bear is

best learned by experience ; but an attempt will be made to give the rules for each case, under its appropriate head, in the following pages.

Some hardy bulbs do better if taken from the ground as soon as they have matured their growth, and wrapped in dry paper, and thus kept until the season for replanting : this, indeed, is the general practice abroad with “Holland bulbs.” Others, again, do far better if left in the ground undisturbed for years. Bulbs grown in water (if desirable to preserve them) should be planted in soil as soon as the bloom fades ; as, otherwise, the store of nourishment is exhausted, no new nutriment is laid up, and the bulb consequently perishes, or does not bloom again for years. We have said that the old bulb is consumed each year, and a new bulb formed. This is done in many ways. Sometimes it is formed in the centre of the bulb, as in the hyacinth ; sometimes it appears on the side, as in the tulip ; sometimes on top, as in the crocus and gladiolus ; and sometimes on the bottom, as in the bulbous iris.

Thus the crocus grows out of the ground each year, the iris buries itself, and the tulips move away from their original position. Many fleshy root-stalks also move ; the new bud being produced beyond the old one, and sometimes several

inches distant. This is an additional reason for occasionally taking up all bulbs, as many are annually lost from a want of this simple precaution. Another reason is, that the bulb, if left in the ground, is often too early stimulated into growth. If, however, we do not care for the finest bloom, but are content with a good display, all common hardy bulbs may be left in the ground undisturbed for three or four years, if once carefully planted.

Bulbs are propagated by offsets, or small bulbs, which are produced at the base of the root, or parent bulbs, and in the axils of the leaves, and occasionally as flower-buds, and which soon produce flowering plants. They are also raised from seed, which, however, seldom produces a flowering plant in less than three years. The scaly bulbs may be propagated by planting the scales in sand; each scale, in time, producing a new bulb. Hyacinths, gladiolus, and some other bulbs, are occasionally increased by cutting the old bulb into pieces; each portion being forced to put forth a new shoot and roots. The two former methods are those used by Nature: the latter we owe to the skill of the gardener.

All bulbs are monocotyledons or endogens: that is, the embryo, or cotyledon, has but one leaf, and the leaves are

almost always parallel-veined, without any, or very slight, ramifications; while those of dycotyledonous plants, or plants having two seed-leaves, are strongly reticulated.

As a class, bulbs are most interesting, whether we regard the facility with which they can be cultivated, or the variety, profusion, and brilliancy of their flowers. A bulb-bed can be gay every month, from early April to November; and the brilliancy of their bloom is unrivalled in the floral kingdom. Their name is Legion, and many of the rarer species are no less curious than beautiful. Their greenhouse and parlor culture is very simple, and the flower well repays the necessary care.

A bulb-case in a south window, and a bulb-bed under it, will give us flowers from January to December, as we begin the year with fragrant hyacinths, and enjoy, in turn, the ever-welcome snowdrop, the gay crocus, the delicate iris, the modest erythronium, the gaudy tulip, scented hyacinths, brilliant narcissus, stately lilies, gladiolus, tigridias, and tardy colchicum, till the double Roman narcissus once again bids us a merry Christmas and a happy New Year.

II.

GENERAL RULES OF CULTURE.



As we have seen that the bulb is renewed yearly, it follows that the chief end of culture should be to facilitate this renewal, especially if we wish the plant to grow stronger year by year, or to increase by offsets.

In ordinary house-culture, this end is entirely lost sight of. The bulb is grown for the flower, which, being already formed when the bulb is planted, is only developed and brought to perfection. When the flower has faded, the bulb is cast aside, and no further care is given; and as a natural consequence, even if the bulb survives until another season, the flower (if it bloom at all) is poor, weak, and worthless.

The primary rule in bulb-culture is, *grow the foliage well*. The stronger and more vigorous the leaves are, the stronger will be the bulb, and, consequently, the larger and finer

the bloom. Neglect of this first rule is the cause of most failures. To bloom the bulbs well the first year is easy: you have only to develop what another has prepared: the success can hardly be called your own. But if, the second year, you can produce as fine, or even finer flowers, you may well claim to possess skill in bulb-culture.

While, however, we may not care to take the trouble to grow our bulbs well, so as to produce finer bloom year by year, it may be well to know how to do it. The present great mart for the more common bulbs is Holland, where bulb-culture is, the business of many principal horticulturists, by whom the foreign market is supplied. This business has been carried on so extensively for many years, that certain exotic bulbs, such as tulips, hyacinths, and crocus, are generally known as "Dutch or Holland bulbs." These bulbs are raised in such quantities, and are so cheap, that, in this country, it is easier to import bulbs than to raise them: so that the bulbs which have flowered in the winter are usually thrown away, or planted in some corner of the garden, where they come up, and bloom year after year, and occasionally produce fine flowers.

The rarer bulbs are more cared for, as they are much more difficult to procure, and far more expensive. The

same general rules of culture, however, apply to both, whether they are hardy or tender.

Imported bulbs are often weak from being kept a long time out of the ground: this is especially the case with lilies and erythroniums, of which a large proportion never survive the first winter: crocus and hyacinths, being of a different nature, are seldom injured. The bulbs should be planted at once in proper soil, according to the species: if out of doors, in a well-drained bed; if in doors, in well-drained pots. There are few bulbs which need a wet situation, and all are impatient of standing water: therefore, to secure good drainage is one of the points of primary importance in bulb-culture. Hardy bulbs may be planted as late as the ground keeps open; and we have often set them out when it was necessary to take off a thick crust of frozen earth before we found ground soft enough to work. In one instance, a lot of hyacinths and crocus, received very late, were planted in the frozen ground (the holes being made with a crowbar), and the next spring showed a fine lot of flowers, but little later than, or inferior to, those planted earlier. It should, however, be stated, that the winter was most favorable to the winter-growth of the bulbs; the earth being covered with snow, and the frost never penetrating to

any great depth : had the winter been " open," all the bulbs would have perished. As a general rule, the bulbs should be planted in October, that the roots may make a good growth before the cold weather sets in.

The mode of planting must vary according to various tastes ; but generally the bulbs should be so grouped as to give the most effect when in blossom. Thus snowdrops, crocus, erythroniums, Persian iris, and other small bulbs, should never be planted singly, but always in clumps, the larger the better ; the single bulbs about an inch apart every way, or in triple lines as an edging to a bed. Hyacinths, narcissus, and other large bulbs, may be planted singly or in lines, but are far more effective planted in threes ; that is, one at each point of a triangle, each bulb about nine inches from the others. A combination of colors may often thus be very prettily contrived.

The bulbs should never be mixed. Let each kind be planted in masses by itself, if the full effect of each be desired. We have often seen a mixture of crocus and snowdrops by which the snowdrops were entirely lost, their simple beauty being wholly neutralized by the more gaudy colors of the crocus. Hyacinths and narcissus do not accord well together, nor do jonquils and frittelarias

(*F. meleagris*). Crown imperials (*Frittelaria imperialis*) should stand by themselves in clumps: if planted in mixture with smaller bulbs, they cause them to appear insignificant by their stately growth.

In arrangement, again, the smaller bulbs should be planted in the foreground, the taller growers behind: thus each, when in bloom, appears to the best advantage.

Much may be effected by a tasteful arrangement of colors: clumps of white, blue, yellow, and purple crocus, planted alternately with broad belts of snowdrops, are very showy.

As a general rule, stakes marked with the names of varieties are unsightly, as too conspicuous. Most bulbs are low growers; and while it may be interesting to know the name of a showy variety, yet to have it forced upon the attention by a painted stake robs the flower of much of its effect. Where care has been taken in the selection of varieties (and named varieties are always the best, and give more satisfaction), it is well to preserve the names; which may very easily be done by having a plan of the bulb bed drawn on a sheet of paper, and the proper position of each species and variety indicated by a figure referring to an index of names. In planting in the open ground,

the general rule is that the crown of the bulb should be placed an inch below the surface: if in a situation, however, where the bulbs would be liable to be thrown out by the frost, an inch and a half will not be too deep. The larger the bulb, the deeper it should be planted; and all lilies and crown imperials should be set three inches below the surface, and even deeper if the bulbs are very large. Crocus should be set deeper than bulbs of the same size, as their tendency is to grow out of the ground; and iris rather higher, as they naturally bury themselves: this upon the supposition that the bulbs are not to be taken up annually. The bulb bed may be made more effective if gently sloped from the back to the front: if under a window, slope it toward the path; but the inclination should always be to the south, as thus, in winter, it receives more sun, and the flowers bloom earlier in the spring. There is often a difference of three weeks in the blooming of bulbs planted at the same time under a south and west window, the difference being in favor of the former. If the house is stone or brick, or has a stone under-pinning, it is a good plan to have a narrow border dug close to the house. Fill this with snowdrops and yellow cloth-of-gold crocus, or the pretty little striped Scotch

crocus: the former, in a favorable season, will bloom in February; and the latter, very early in March.

The bulbs being planted (say about the middle of October), there is nothing more to be done until the ground begins to freeze. But the bulbs are by no means idle: no sooner are they planted than they begin to grow. A crocus or hyacinth will in a few days throw out a root an inch long, if in a moist soil; the shoot also begins to protrude, and in a few weeks the plant is fairly established. As soon as the ground begins to freeze at night, the bed should be covered with three or four inches of coarse litter, which will prevent the earth from freezing very deep, and thus allow the roots to grow all winter. Unless the cold is very severe, the plants will continue to push; and, when the covering is removed, — which it should be about the middle of March, or when the snowdrops push up through the litter, — the bulbs will be found to have made sprouts an inch or more in length. These, of course, will be yellow, from not having been exposed to the light; but they will soon turn green. As soon as the flowers have faded, all seed-vessels should be removed, unless it is desirable to raise seedlings; as the ripening of seed weakens the bulb. If the spring is very dry, the bed should

be occasionally watered, to prevent the premature ripening of the foliage, and to encourage its growth.

As soon as the leaves have faded, they should be removed ; and the bulbs should rest (if not taken up) until they naturally begin to grow again. Showy annuals (such as portulaca) planted through the bed will cover all bare places during the summer, and do not send their roots deep enough to injure the bulbs. As soon as the frost has killed these, the bed should be cleared, carefully forked (except where the bulbs are), and a coating of fine manure supplied. It is a good plan to apply weak liquid manure ; and an addition of powdered charcoal to the soil of the bed will give additional brilliancy to the flowers.

Powdered bone or horn-scrapings are also excellent manures.

The culture of tender bulbs is, in a measure, similar to that of the hardy species. Potted in well-drained pots, they should be gently watered, and kept in a warm, shady place, till they begin to grow ; then water should be more freely given, and they should be placed in full sunlight, and as near the glass as possible, to encourage a thick, sturdy growth.

When in bloom, they should be kept cool, that the duration of the flower may be prolonged.

During growth, copious syringing should be given, to destroy the red spider, the great enemy of greenhouse bulbs.



They should not be allowed to ripen seed. After blooming, the leaves should be grown until the tips begin to turn yellow ; when water should be less freely administered, and the plants be gradually dried off. When thus at rest, the pots should be turned on their sides, placed on shelves under the greenhouse stage, or in a shed or cellar, and so remain until the season for repotting. Bulbs with ever-green foliage should never be entirely dried of ; but the supply of water should be greatly reduced until the plants again show signs of growth.



As a general rule, a soil with a proportion of sand is best suited to the growth of bulbs. Some even thrive in pure sand; and there are very few which will succeed in heavy, close, clayey, or peaty soil.

This fact must be borne in mind in the culture of all bulbs. Many require a rich soil, and some will bear manuring; but even these need light soil and well-rotted manures. A good compost for the growth of common bulbs is one part clean sand, one part leaf-mould or rich garden-loam, and one part well-rotted cow-dung. A good substitute for this latter is the bottom of an old hot-bed; but it should be very well rotted, so that its component parts cannot be distinguished, and such as will fall away like loam.

In the preparation of beds for hardy bulbs, the following directions may be given : —

SITUATION.

This should always be sunny ; though, except for early-blooming species, it need not face the south. There are, in all the numerous family of bulbs, very few species that delight in shade. Many of our best-known bulbs are natives of countries where the sun is far hotter than in our own ; where the year is divided into but two seasons, — the rainy and the dry, — during the former of which the growth is perfected, and, after blooming, the plant rests in a state of perfect inactivity till called into growth again by the return of the wet season, or, in some cases, sending up its flower-stem, then followed by the growth. In this latter case, however, the bulb is at rest ; the bloom being perfected during growth, and only developed at a later period.

In the culture of bulbs, as well as in all other culture, we must, by every means in our power, approximate to the natural conditions of growth ; and, the nearer we attain this end, the more perfect will be our success. Thus it follows, that, while a bulb-bed should have plenty of sun, it should not be so dry that a good supply of moisture cannot be

obtained during the growing season. These two conditions we can seldom find ; and, even if we could, few soils are rich enough for bulb-culture without further preparation : and therefore, having selected a sunny exposure, where no large trees may, by their branches, shade the bed, or, by their roots, rob it of its richness, our next step is the

PREPARATION OF THE BED.

The bed should be at least thirty inches deep, of good bulb-soil ; and must be well drained. As few situations naturally fulfil these conditions, excavation is necessary. First, throw off all the black loam in piles at the side, and then cart away all yellow loam, sand, or gravel, to the required depth. If the subsoil is gravel, the bed is ready for filling ; letting the bottom, however, slope gently from back to front, the front of the bed being the point of observation, or that from which it is seen to best advantage when in bloom. If, however, we have a stiff clay subsoil, or any that will retain water, it will be necessary to go from six to nine inches deeper for drainage.

This space should be filled with small stones, laid to a blind drain at the lowest part, to carry off all superfluous water. The loam that was removed from the surface may

then be filled in, provided it does not more than half fill the bed; and the bed should then be filled up, some four inches above the former level, with prepared soil, of equal parts of loam, or leaf-mould, clean sand, and well-rotted cow-manure, or old hot-bed. A few days should be allowed before planting, that the soil may settle. It is always well to have the surface of the bed an inch or more above the surrounding soil; and the surface should slope gently from the centre to the sides, or from the rear to the front.

A most excellent compost for bulbs, especially for ranunculus and anemones, is made by taking the turfs of an old pasture, making a heap of them, and letting them rot for two or three years, turning them occasionally to pick out any insects or hard foreign bodies.

The sand used should be clean and fine, or, as gardeners say, "sharp;" free from all stones or earthy matter, and fresh. If sea-sand is used, it should be well washed, to take out the salt: there are but very few bulbs that flourish in a soil containing salt.

POTTING.

In planting bulbs in pots, the same primary rules of drainage should be observed. This is effected by filling the

pots with about an inch of broken potsherds, or "crocks," and then filling up with prepared soil. Small bits of charcoal, about the size of a hazel-nut, make a very good drainage, and contribute to heighten the brilliancy of the flowers.

The chief care in the growth of bulbs in pots is to prevent the soil from becoming sodden through imperfect drainage, or too dry from want of sufficient water, during the season of growth.

It must be borne in mind that the vigorous growth, once begun, should never cease until the season of rest arrives; and any check received from neglect in watering, greatly injures the bulb.

MANURES.

All manures should be well decomposed, or "rotted." Fresh or very strong manures are injurious.

Cow-dung is the principal manure used; but this should always be a year old, and never be hot.

Horse-dung should never be used, unless perfectly decomposed, and deprived of all heating principle.

Any manure should be clean, or "very fine;" that is, free from worms and slugs, and with no admixture of straw

or stubble. It should be in such a condition as to be thoroughly incorporated with the soil.

In the formation of a bulb-bed, it should be well manured, and will not generally require further manuring, except the autumn top-dressing, for several years. If, however, it becomes poor, liquid manure may be advantageously administered. This should be made by mixing cow-dung and rain-water; and it should be applied at night, over the surface of the bed, from the fine rose of a water-pot, when the plants are not in bloom and in growth. Weak guano-water may also be of service, but should be used with caution. Powdered charcoal may be mixed with the soil with advantage to the flowers. Ground bone is an excellent manure for a bed of hyacinths. Horn-scrappings, or piths, answer the same purpose.

Bulbs grown in pots need no manure if the soil has been properly prepared. Waterings of weak manure-water may, however, be given where a weak growth seems to require it.

Bulbs grown in water are greatly improved by the addition of a few drops of aqua ammonia to the water each time it is changed.

In potting hyacinths and tuberoses, after the drainage, it is our practice to fill in between one and two inches of

dried cow-droppings, collected from the pastures, and which have been exposed to the weather during the winter. These are crumbled up and pressed down, and the pot then filled with prepared soil. In watering, this mass of manure becomes soft ; and when the young root of the bulb, pushing through the soil, comes in contact with it, the effects are at once evident in the growth of the plant. By this means, we have obtained remarkably fine spikes of bloom.

These remarks must be understood as applying to plants which are true bulbs, and as not being without exception. A bed for gladiolus is best prepared by plentifully manuring with stable-manure, digging it in about November, and planting the bulbs in early spring. Many lilies are rather gross feeders, and will bear any manure which is not heating. Tubers, or creeping root-stocks, such as dahlias, cannas, and German iris, delight in a strong, rich, well-manured soil, and do not thrive in sandy loam : but generally sandy loam is best suited to bulbs ; and, where they are planted in a stiff soil, it is best to fill a handful of sand in the hole made for the bulb, to prevent its rotting in winter from too much dampness.

IV.

BULB CASES; GROWTH IN WATER, MOSS, AND SAND.



ONE of the most satisfactory modes of growing bulbs in the house is in a bulb case. By this very simple contrivance, all the objections to plants in pots are obviated, and the plants thrive much better.

The bulb case is a simple oblong table, as long as the window, where you wish to grow the bulbs, is wide, and wide enough to accommodate three medium-sized pots in each cross-row. A very good size is four and a half feet in length by two feet in width in the clear, so as to hold three rows of eight pots each. Let the table be hollow, and eight to ten inches deep, all thoroughly joined together, and well coated with white lead on the inside, particularly around the joints. Into this table fit a zinc pan of the same depth, with wire handles which turn down inside at each end. The prettiest style of table for a parlor is of oiled black walnut, with turned legs, pan-

elled sides, and as high as the sill of the window. It should be fitted with strong castors, that it may run easily, and be turned if the plants grow one-sided. If any other form is employed, — and we give only the above form and dimensions as being those most simply made, — the only care is to see that it is so proportioned that there is no waste room on the inside ; that is, that it may accommodate a certain number of pots without small bare places.

If the table is made circular, the whole top may turn on a pivot. After the bulbs are potted in October, they should be put in a dark cellar, and moderately watered. for three weeks, to encourage the growth of the roots. When the pots are filled with roots, or when they touch the sides of the pot (which may easily be ascertained by inverting the pot, giving the edge a sharp rap, when the ball will come out entire, may be examined, and may then be replaced in the pot without injury to the plant), the pots may be brought from the cellar, and placed in the bulb case. Fill the case with pots, and fill common moss obtained in the woods, or sphagnum from the meadows, into all the interstices, and as high as the top of the pots ; then cover all the pots about half an inch with the rich green moss which may be found on

shady rocks in oak woods. The shoots of the bulbs will soon push through the moss if the table is placed in a sunny window ; and, if the moss is kept well watered, we shall have a bed of hyacinths in a garden of moss.

Of course, with such constant watering, much water will accumulate in the bottom of the pan : but this will produce no bad effects ; the roots of the plants in time running through the holes in the bottom of the pots, and luxuriating in the wet moss. The plants placed in the case early in November will bloom about Christmas. As soon as the bloom fades, the pots should be taken from the case, placed in a light cellar, watered to encourage the growth of the foliage, and their places supplied with other pots brought from the cellar. As the plants will not all bloom at once, the case will always, by thus renewing, have plants in bloom from Christmas to April.

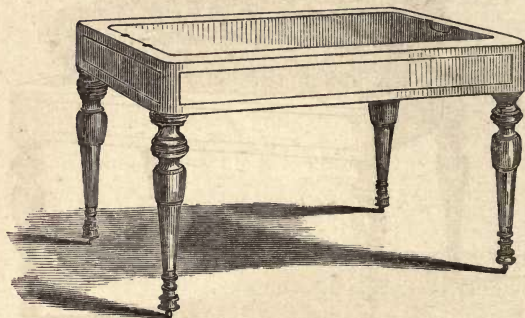
To maintain this succession, a stock of from seventy-five to one hundred bulbs should be potted ; and some attention should be paid to the period of flowering, as some varieties bloom very early, and others always bloom late and cannot be forced. The early-blooming varieties should be brought forward in early winter, while the later should be left in the cellar till February.

The stock of bulbs may all be potted at the same time, or at intervals of a month. Care must be taken not to over-water them while in the cellar, as too much moisture causes rot both of roots and tops. The larger bulbs should be planted one in a pot ; but of smaller, such as crocus, tulips, and jonquils, three may be placed in the same pot.

A number of double Roman narcissus should always be potted for very early blooming : these will be out of bloom by the middle of January, and may be replaced by *Polyanthus narcissus Gloriosa* (one of the earliest and best) ; and these in turn by the stronger and later varieties, of which *Grand Primo* and *Grand Monarque* are the best. The narcissus, being of tall habit, should be placed in the middle of the case.

The accompanying plates may give a good idea of the bulb case before it is filled and after the plants are in bloom.

The great advantage of growing plants in cases is, that all spilling of water or overflowing of saucers, and all risk of overturning or breaking the pots, is avoided ; and thus plants may be grown in the parlor without " making dirt."



IN GLASS CASES.

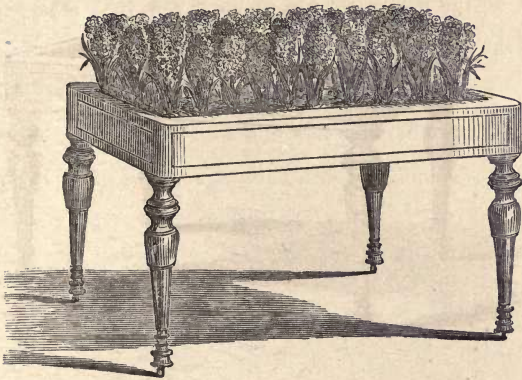
Bulbs are sometimes grown in close glass or Wardian cases.

The treatment is very simple ; being merely to plant the bulb in the soil, and to give air enough to prevent rot or mould.

We have, however, found that, in every case, the leaves become tall or “drawn,” and the flowers were lacking in brilliancy.

IN WATER.

This popular mode of growing bulbs seldom gives very fine flowers ; but its simplicity and pretty effect will always



recommend it. The bulb should be placed in the glass in November; the glass being filled with rain-water up to the neck, so that the base of the bulb may just touch it. Place the glasses in a warm, dark place, keeping them filled with water, for three weeks, or until the glass is half filled with roots; then remove to the light, and gradually to full sunlight.

After blooming, if it is desirable to preserve the bulb, it should be taken from the glass, and planted in earth, to strengthen it.

The water in the glasses should be changed every week, or as often as it becomes cloudy (a bit of charcoal in the water will, however, keep it sweet and clear); and, in

renewing the water, care must be taken that that supplied be of the same temperature as that taken away.

There are many forms and colors of glasses: those of dark glass are best for the bulbs.

The accompanying figure shows some of the many attractive forms:—



The bulbs usually grown in glasses are hyacinths: but we occasionally see English iris, tulips, and narcissus, which make a pretty show; the treatment required for them being the same as for the hyacinth.

A few drops of glue or ammonia, added to the water in which bulbs are grown, increases the brilliancy of the flower, and strengthens the bulb.

IN VEGETABLES.

Hyacinths are sometimes grown in a carrot or turnip, hollowed out, and filled with water. The bulb grows well ; and a growth of young foliage springs from the top of this novel flower-vase, and entirely conceals the bulb. In this way, many pretty effects may be produced. The treatment is the same required by bulbs in glasses.

IN MOSS.

Pots or glasses may be filled with moss, and bulbs grow very prettily therein. The treatment is the same as that required by bulbs in earth. A very pretty way is to make a ball of moss, fill it with bulbs, wire it round, and hang it in a warm, light place ; occasionally turning it to make an even growth, and dipping it in water when it gets dry. The shoots of the bulbs will cover the moss, and the roots will run through the inside. The Jacobean lily (*Sprekelia*, or *Amaryllis formosissimus*), grown in this way, blooms beautifully, and is a fine summer ornament.

IN SAND.

This mode is popular, as sand is cleaner than earth, and the contrast of the white sand and green leaves is very pleasing. The only care necessary is to see that the sand contains no salt, and that it never becomes dry. The other treatment is the same required by bulbs grown in earth.

CROCUS-POTS.

Crocus are often grown in fancy china-pots, representing porcupines. They are planted so that the leaves may represent the quills of the animal. The pots may be filled with earth, moss, or sand, and treated as directed for bulbs thus grown. The great difficulty is to produce an even growth, the effect generally being a porcupine with quills in a very dilapidated condition; and therefore this mode of growth is not now as popular as formerly.

V.

DISEASES AND INSECTS.



DISEASES are not of frequent occurrence in bulb culture, if proper attention is paid to the preparation of soil, and the application of water; and bulbs are subject to the attacks of few insects, if reasonable care is taken. The principal are red spider, green-fly, mealy bug, black, brown, and white scale, mildew and rot.

PREMATURE FLOWERING.

Premature flowering — that is, the flowers of such bulbs as hyacinths expanding without pushing up a flower-stalk — is not strictly a disease, but is caused by improper culture. This not unfrequently occurs when the bulbs are exposed

to light and heat soon after planting, and before they have had time to put forth roots. As there are no roots to draw nourishment from the earth, the bulb is thrown upon its own resources, and the leaves and flower are produced at the expense of the nutriment already laid up in the scales of the bulb. There is no power or strength to throw up a foot-stalk, and the flowers half expand down in the bulb. Often, in such cases, we find, in the course of time, the withered flowers elevated on a long foot-stalk; showing that, as soon as sufficient roots were matured, the bulb did all that was necessary to produce a fine flower.

* This same premature flowering sometimes occurs, even where there are plenty of roots, if the room where the plants are grown is subject to great variations of temperature. Where this is the case, the simple remedy of a more equable temperature, and more air, will produce satisfactory results.

It sometimes happens that a bulb will develop flowers on a short foot-stalk, in spite of every care. This may be the effect of too much direct sun and heat, or may be a defect in the bulb. An easy course of treatment is to make a cylinder of card-board, stiff brown paper, or some other

opaque substance, just large enough to fit over the shoot of the bulb, and about eight inches long. Fit this over the bulb, and it will cause the leaves and flower-stalks to grow out of it to reach the light. As soon as both are sufficiently long, the case may be removed.

TARDY FLOWERING.

This often occurs from want of sufficient light or heat. In the former case, the leaves and flower-stem become drawn and white, and the flowers are pale: in the latter, the plant is somewhat stunted; and the flowers die without expanding, or are destitute of color. If the flower-stem is gone, the only treatment is to grow the plant well, that the foliage may mature a good bulb for another year, by giving plenty of light and heat. If, however, the flower-buds have not withered, the buds will, by removing the plant to a warm, sunny situation, gain color, and give good bloom.

It is worthy of remark, that neither premature nor tardy flowering occurs in open-air culture, but only attack house-grown bulbs. The inference is obvious that they are caused by our treatment not supplying some requisite of growth which Nature affords.

RED SPIDER.

Some bulbs are especially liable to the attacks of this pest of greenhouse culture. Those with soft leaves, such as hyacinths and narcissus, are not generally troubled; but those with stiff, gladiate foliage, as most of the Cape bulbs, seldom escape.

It will be noticed that this is usually a trouble in parlor or greenhouse culture, out-door bulbs being seldom attacked. The presence of the spider is easily known by the foliage of the infested plants assuming a rough, scaly, reddish-brown or white appearance; or, in severe cases, being covered with minute, hardly visible cobwebs, and inhabited with myriads of small red spiders.

An examination of any foliage so infested, under a microscope, shows a network of web covering the whole leaf, and the presence of multitudes of insects, and this even before the effect of their presence is perceived by the naked eye.

These spiders feed upon the juices of the plant, and, by sucking all life from the foliage, weaken, and eventually destroy, the bulb. They also invest the scaly covering and skin of those bulbs (such as amaryllis) which require to be planted one-half above the surface of the ground.

Heat and drought are favorable to their growth and development; and they are most abundant in the warmest and sunniest parts of the greenhouse, such as the top shelves near the glass, where Cape bulbs are usually grown to prevent them from becoming drawn.

The remedy is copious syringing, whenever the plants are not in full sunshine. If the foliage can be kept moist for a while, it is certain death to the spider.

This is the reason for the constant syringing of foliage required in the culture of Cape bulbs, as, without great care, they are sure to be attacked by spider. In this the old maxim, "An ounce of prevention is worth a pound of cure," well applies; for if the red spider once establishes himself, and browns the leaves, the beauty of the plant is gone for the season.

While red spider is peculiarly a subject of in-door culture, it sometimes, in times of drought, becomes formidable in the garden. During the last two summers of extreme drought (1864 and 1865), it has been very common on gladiolus as well as on many garden-plants; but, though always to be found on garden-plants in summer, it seldom produces any perceptibly injurious effects.

Where the spider is very plenty, a little flower of sulphur may be dusted over the foliage to advantage.

A good preventive is to place a pan upon the flue of the greenhouse, fill it with water, and dust into it a few handfuls of flower of sulphur: the fumes arising from this when the water becomes heated are death to the spider. Care must be taken not to allow these fumes to rise upon very delicate plants, as they are sometimes injurious.

The common remedy of putting sulphur on the flue should be used with great caution, as, though sure death to the spider, it often kills the plants, or causes them to lose their leaves.

In house-culture, the simplest remedy for spider is syringing, or, where this cannot be done, frequent sponging of the foliage with pure water, or sulphur and water.

GREEN-FLY.

The green aphid, or fly, so common in greenhouses, is often found on the foliage of bulbs.

The easiest and best remedy is a gentle fumigation of the greenhouse, or of the infected plant under a barrel, as in the ordinary treatment of house-plants for this pest.

The insects are stupefied by the smoke, fall from the foliage, and are easily washed away by a subsequent syringing. This latter is important, as the tobacco seldom kills, but only stupefies, the fly; and if not washed off, and drowned by the water, the insects crawl up on to the foliage again, and the labor is lost. It is also useful to wash off any which may still cling to the leaves.

MEALY BUG.

This enemy is much more difficult to conquer than the two preceding, as no general application will be effective. Fortunately, bulbs are but little infested. The remedy is to pick or wash off the insects by a careful sponging of the foliage. A touch of kerosene oil, applied to the bug with a very fine camel's-hair pencil, is instant death, and not injurious to the plant.

Where these insects infest the scales or skin of greenhouse bulbs, as is not uncommon, they are with difficulty extirpated. The treatment is to peel off so much of the old skin as can be done without injury, and then carefully remove all bugs that can be seen, and repeat the process as often as any bugs can be found.

BLACK, BROWN, AND WHITE SCALE.

Bulbs that make an annual growth are seldom troubled by these insects ; but they are not uncommon on those with evergreen foliage.

The simple treatment of washing the foliage and leaf-stalks of the infested plants with a sponge dipped in weak warm soapsuds will be found effectual in all cases.

House-bulbs are seldom liable to be attacked by these insects.

MILDEW

Sometimes attacks soft-foliaged bulbs, but is easily removed by a sprinkling of flower of sulphur over the diseased part, or by putting sulphur on the flue of the house in a pan of water, as previously directed. It is caused by too much moisture, and is especially prevalent in damp warm weather.

ROT.

This disease attacks the bulb, and is not susceptible of curative treatment. When a bulb is attacked by wet or dry rot, if it has not progressed too far, or is not in the

core or heart of the bulb, cutting away the affected parts with a sharp knife will sometimes save the bulb; otherwise a diseased bulb should never be planted, as it may infect others.

Gladiolus are subject to a peculiar form of rot. The surface of the bulb is covered with black specks, which spread all over it, and finally dry up and kill the bulb. Such bulbs should not be thrown away (especially if of valuable varieties), as they sometimes recover; but should be planted by themselves, that they may not infect sound bulbs. We have noticed that bulbs in heavy soils were more subject to this disease than those in soil of a light, sandy nature; and also that old bulbs are much more likely to be affected than young ones.

A remedy, or rather preventive, may be to put a little sand in the hole in planting the bulb, and to raise seedlings instead of planting old varieties; the latter to be especially recommended, as our American seedlings are better than imported varieties.

In the attention paid to the culture of the hyacinth in Holland, several diseases have developed themselves, which are best described in an article translated from the Dutch for "The Gardener's Magazine," from which we give the following extracts:—

“The hyacinth is liable to seven diseases: *first*, the white rotz; *second*, the black rotz; *third*, the rot; *fourth*, mould; *fifth*, consumption, or wasting; *sixth*, shrinking; *seventh*, excess of offsets.

“*First*, The white rotz is known by a resin, which generally oozes from the upper part of the bulb, and also from the side, about October; and is of a hard consistency, not unlike the resin that flows from trees. The white rotz also assumes the appearance of a white, slimy substance, and has a very unpleasant smell, which is particularly evident when the bulb is cut open; and bulbs in this state should be thrown away without hesitation. The rotz has been assumed to be incurable, and bulbs so affected are generally thrown away: they should never be planted, as they infect the ground to such a degree, that sound bulbs, planted in the ground as late as three years after, become infected. Where the diseased bulb is very valuable, if it is placed in a place where snails abound, they will eat out the diseased part, and the bulb often recovers and grows.

“*Second*, The black rotz is more difficult to know than the white rotz, because, as soon as the bulb is taken out of the ground and kept dry, the rotz dries up also. The stool, or plate, of the bulb,—that is, the point from which the

roots proceed,—appears as if eaten out on the side ; and the scales at that part have dry, black edges. When, therefore, there is but little of this disease in the bulb, it is very difficult to be ascertained ; and it must be particularly looked for when the bulbs are about to be put into the ground, as it will not only destroy the infected bulb, but all those that are healthy near it. A bulb so attacked, must, therefore, be thrown away.

“ *Third*, The rot is easily known when it is once fairly begun. It is generally found in the scales near the heart of the bulb ; and, to discover it, the point of the bulb should be cut off horizontally with a sharp knife. If the bulb is affected with this disease, a yellowish or brownish stripe will be seen between the scales, and all the part thus discolored should be cut away till it is completely eradicated ; but, when it reaches farther than half of the bulb, it is past remedy, and the bulb must be thrown away. Great care must, however, be taken, in cutting off the point of the bulb, not to injure the germ which has formed inside of it ; and, when this is likely to be the case, the cuts should be made, not horizontally, but in a slanting direction, towards the point of the bulb, so as not to run any risk of cutting off the extremity of the incipient flower.

“It frequently happens that these stripes are but very little distinguished from the color of the healthy part of the bulb; and therefore great attention is necessary, that they may not be overlooked. When two, three, or more stripes are seen round the heart of the bulb, it is generally past recovery; but if they are found far from the heart, and consequently near the outer scales, they can all be cut away, with the exception of such as have reached the root-plate and attacked it. Above all, care must be taken that neither the germ nor the root-plate of the bulb is injured; but all parts round them may be cut away.

“*Fourth*, The mould is found only on the outer or inner part of the first four scales: it is not considered a dangerous disease, but must be removed by taking off those scales that are attacked.

“*Fifth*, Consumption, or wasting, is indicated by never-varying yellowish or brownish spots in the scales near the heart. This disease is not a dangerous one, but is rather an indication of a weak flower, and is very common with several varieties. These spots may go through the whole bulb without being injurious: therefore they are not to be compared with the stripes of the rot.

“*Sixth*, Shrinking is indicated by spots similar to those

above mentioned, only they are much larger. This disease generally draws the whole bulb in a slanting direction, and a part of it appears as if eaten out. The bulb loses its usual round form. This is similar to the disease called *wasting*, but in a greater degree, and is with great difficulty removed. It is better to throw away all bulbs attacked with this disease.

“*Seventh*, Excess of offsets takes place only in bulbs capable of producing flowers. The offsets come out at the sides or through the stool or plate, and the parent bulb becomes divided into a number of young ones.

“When this is the case, it is left exactly as it is, and planted like the others; and, although the bulb will not flower, it will produce a great many young bulbs.

“Bulbs which have been cut to eradicate disease should be planted within thirty-six hours after, as a further delay may be conducive to the re-appearance of disease.”

Bulbs in the open air are subject to few enemies. Crocus are sometimes eaten by field-mice, and mice are also very fond of tiger-flowers; but the depredations thus committed are few.

Careful preparation of the bulb-bed, and proper planting, will almost always give a fine show of bulbs in the garden.

VI.

THE HYACINTH, SCILLA, URGINEA, MYOGALUM, NARCISSUS.

THE HYACINTH.



THE many hundred varieties of hyacinth known to our gardens have all descended from one species, — *H. orientalis*; which is found wild in Asia, near Aleppo and Bagdad.

In its wild state, it is generally blue, sometimes pink, and, of course, single. It is mentioned by Gerard, and must have been introduced before 1596. Till the

beginning of the present century, though there were many double varieties, the only colors known were white, blue, and pink: the straw or lemon colored varieties were then produced from seed; and, at the present day, there is scarcely any shade of any color which has not been produced in the hyacinth.

The soil suitable for the hyacinth is a light, friable, sandy loam, from which all stones, sticks, and other coarse material, have been removed. The soil should be coarse enough to pass through an inch sieve ; and should never be very fine, nor yet of a coarse, tenacious nature.

To such a soil, a liberal quantity of well-rotted cow-dung, free from straw and coarse material, should be added ; and a few bushels of clean soot, if for a very large bed.

This latter will act as a manure and improve the flower, and also drive away any noxious grubs and worms. The compost should be well mixed, and the parts thoroughly incorporated. If, when prepared, it is so close as to cling together when pressed, a few bushels of clean fresh sand may be advantageously added.

This compost is all that is required for the growth of the hyacinth, both in pots or in the garden.

SELECTION OF BULBS.

The bulbs should be clean, roundish, hard, and heavy. Those bulbs presenting a surface of scales should not be chosen, as they seldom give good bloom ; but those having the surface covered with a thin, clean skin, should be selected.

Size is no criterion ; for some varieties always produce large bulbs, and others are usually small. Round, medium-sized, plump bulbs, the base or root-stool flat, hard, free from mould or decay, and not sunk, and the top formed of small, closely-fitted scales, with perhaps a stout, strong shoot just pushing, will give the best flower : those having a hollow apex should be avoided.

Large, light, scaly bulbs seldom produce close, compact spikes of bloom, though often throwing a fine mass of foliage, and giving several loose spikes of bloom. Double-crowned bulbs, though usually producing two spikes of bloom, are not desirable, as the flowers are generally inferior in size.

Bulbs should be selected as soon as imported : the exposure to the air, and the handling they undergo in a florist's shop, do not tend to improve them. If the bulbs are not to be planted immediately, they should be kept in a cool, dry place, laid singly, or wrapped in thin paper, and as nearly as possible in a state of perfect rest. If kept too moist, the roots are excited to growth ; and if too hot, the tops sprout. If by chance the roots have started, the bulbs should at once be planted. The single varieties produce the finest spikes and more flowers ; the double, the finest single

blooms. Double varieties are not fitted for growing in water or for very early forcing ; and generally, for growing in the house, the single varieties are to be preferred.

PLANTING IN BEDS.

Hyacinths are most effective in the garden ; and, the beds having been prepared of a proper compost, the bulbs may be planted in October.

Varieties should not be mixed, as they vary greatly in height, general habit, and time of blooming, so that a mixture is sure to produce a bad effect. Therefore, whether they be planted in lines or clumps, let each line or clump be of one variety, and, of course, of one color.

The bulbs should be planted three or four inches deep, according to the size ; the larger being planted deeper, and about six inches apart, in lines or double lines ; a foot being allowed between each line, and six inches between each double line. A very pretty way is to fill the bed with triangles of three bulbs of the same color, taking care to let the colors of the different triangles contrast well, and not to plant two triangles of the same color together ; the two bulbs at the base of each triangle being nine inches

from that at the apex, and the same distance from each other, and a foot being allowed between each triangle.

Hyacinths should always be planted in dry weather ; and if set in common garden-soil, in which they sometimes do well, a little clean sand should be placed round each bulb to prevent rot. The bed should be covered with leaves or litter as soon as the frost sets in, and remain covered till the bulbs push in spring.

A writer in "The Cottage Gardener" gives the following directions for the preparation of a common bulb-bed, which will serve for those who have not time for more thorough preparation : —

"When the beds [of the garden] are cleared of their summer occupants, it is time to prepare them for planting bulbs, to bloom in April, May, and the beginning of June. Nothing is better than deep digging, or trenching, placing at the bottom of each bed six inches of fresh or recently fallen tree-leaves, which should be covered with a foot of soil ; and they will serve to raise the beds considerably, and allow water to drain away freely. In the course of a year, the leaves will be pretty well decomposed ; and, on digging in the succeeding autumn, they will be brought to the surface, and thus the soil will be enriched by a not over-stimu-

lating manure. Fresh leaves being put in every autumn, the beds annually receive a dressing of vegetable matter, which saves dung, and, in dry summers especially, the roots [of bedding-plants] lay hold of the decomposing leaves when the plants are becoming exhausted by blooming. The beds should slope from the centre to the sides ; and the borders, from the back to the front."

PLANTING IN WATER.

As we have said, the single varieties are preferable for forcing in water, sand, or moss. The heaviest bulbs, with no offsets, or marks of imperfection or decay at the base, should be chosen. They should be placed in the glasses about the first of November ; the glasses being filled with rain or river water, and the base of the bulb just touching the water. They should then be placed in a dark place where the temperature does not exceed 50°, and remain about a month, or until the roots are three or four inches in length. They may then be brought out to the light, and gradually inured to full sunshine. As the water evaporates, it must be supplied, and must be changed as often as it becomes discolored or impure ; or it may be kept sweet

by the addition of a small bit of charcoal. The plants should be kept at an even temperature, and the foliage washed occasionally if it becomes dusty; and the glass should be frequently turned, that the plants may not become one-sided.

A few drops of hartshorn added to the water are beneficial to the bloom; and we have given liquid manure, say ten drops, twice a week, with good results. After blooming, the bulbs should be placed in earth to mature their foliage. Hyacinths grown in water will not bloom the next year, but will the third season if grown in soil.

IN MOSS OR SAND.

Hyacinths grow well in moss or sand, and latterly have been most successfully grown in England in cocoanut refuse. The vessel, or pot, should have about half an inch of pounded charcoal placed at the bottom: on this the moss or sand should be placed, and the bulbs planted up to the apex. Place the whole in a dark place, as directed for bulbs in water, previously giving a good watering; and, when brought to the light, plant little sprigs of *Lycopodium denticulatum* between the bulbs, or cover the surface with

green moss from the woods. The plants will need to be kept moist, and the leaves must be sponged to keep them clean. Hyacinths may also be grown in turnips or carrots, hollowed out as directed in a preceding chapter, and produce a pretty effect.

IN POTS.

As a general rule, a hyacinth should not be grown in a pot less than twice the diameter of the bulb; and, where more than one bulb is grown in a pot, the distance between each bulb should be equal to the diameter of the largest.

For single bulbs, pots six inches in diameter are sufficient; but, when they can be procured (and any potter can easily make them), we prefer a bulb-pot four inches wide, and from eight to ten deep, which gives better room for the development of the roots. Three hyacinths in a pot look very well, and the same objections to combination of color do not exist in house as in garden planting. A very pretty effect is produced by a red, white, and blue hyacinth in the same pot.

The pots being prepared by placing a crock on the hole in the bottom of each, and the bulbs being ready, the offsets

and all loose scales having been removed, we proceed to pot the bulbs ; the time being from the first of September to the middle of November, according to the time at which we wish them to bloom. Often, however, it is best to make several plantings, at periods of from two to four weeks, to secure a succession of bloom. And, first, place about half an inch or more of dried cow-dung, such as may be picked up in the pastures, crumbled fine, and free from wire-worms or grubs, at the bottom of the pot ; then fill in with the prepared compost, placing the bulb so that its apex is just above the surface of the soil, and the soil about half an inch from the top of the pot at the side, and sloping *from* the bulb. Give a good watering from the fine rose of a watering-pot, and set the pots in a sheltered place, on a bed of coal-ashes, if out doors or in a cellar. The ashes will prevent earth-worms from entering the pots. The object now is to promote the growth of roots before the shoot develops, which is effected by “plunging” the pots, or by putting them in a dark frame. By the former method, the pots are placed close together, and covered with from four to eight inches of coal-ashes, tan, or any material of similar nature ; and thus they are to remain until the roots touch the sides of the pot, when they, or as

many as are needed to bring in, are taken out, and gradually inured to the light.

This same object is as well gained, however, by placing the pots in a cool cellar, or in a cold frame darkened.

Hyacinths thus plunged in coal-ashes can be safely kept all winter, and be taken out and forced into bloom in early spring, as they are not injured by frost. They need, however, to be protected from soaking rains.

Where hyacinths are required for bloom in early winter, they require to be forced. For this purpose, about the 1st of October, they are taken from the frame, and placed in a gentle hot-bed made of horse-dung, and remain there till the pots are full of roots, and the tops begin to start, which will be in about a fortnight: they are then taken to the greenhouse, and gradually forced into bloom by gradually increasing the temperature, giving them plenty of air, keeping them near the glass, and keeping the soil moist, but not wet. They should have all the sun that can be given. The temperature at its extreme should range from 55° to 70° ; and care must be taken that the plants experience no sudden check.

By bringing in successive lots of hyacinths, a succession of bloom may be had from Christmas to May Day. If the

grower has no greenhouse, he may grow the bulbs in a parlor ; keeping them in the cellar until he wishes to bring them forward, or in a cold frame as above directed.

As a general rule, hyacinths potted in September will bloom in December ; those potted in October and November, in January, February, and March : but these seasons may be greatly varied by forcing and retarding.

When coming into bloom, hyacinths should be watered with weak liquid manure, unless potted with cow-dung as before directed, in which case they will not need it.

We copy from an English work the following rules of hyacinth-growing, and which apply well to all Dutch bulbs. The essentials to success in growing hyacinths are, —

“ *First*, Placing the bulbs in a cool situation until the pots are filled with roots.

“ *Second*, Keeping them near the glass ; for, the more light, the greater is the elaboration of the food and the more stiff is the foliage, the more compactly are the bulbs arranged, the stouter the stalk that supports them, and the brighter the color of the flowers.

“ *Third*, The size of the flowers, and the shortness, or rather stiffness, of the spike, depend upon their having plenty of air on all favorable occasions.

“*Fourth*, That they have no more heat than is necessary to maintain the plant in a healthy growing state ; for, the more naturally a plant is excited, the more satisfactory are the results.

“*Fifth*, A free, open soil, with plenty of vegetable matter.

“*Sixth*, Perfect drainage, and being kept free from worms.

“*Seventh*, A moist soil at all times, neither too wet nor too dry ; but double the quantity of moisture may be afforded when the truss is nearly developed, every alternate watering being with weak liquid manure, at the temperature of the house or room.

“*Eighth*, When in bloom, their beauty will last much longer if they are kept in an almost invariable temperature of 40° to 45°, instead of a variable one ; but they must be fully in flower, or the colors will not be so bright nor the flowers so fine without a sufficiency of light and heat.

“*Ninth*, The hyacinth will bloom much more satisfactorily in a house from which frost is only excluded than in one where fire-heat is employed.”

In selecting hyacinths for early blooming, some regard must be paid to the variety, as some are always early, some

always late bloomers; and it is as useless to attempt to obtain a Christmas bloom from a late-blooming variety as to obtain a satisfactory March bloom from a bulb which naturally blooms early.

After blooming, water should be gradually withheld from the plants until the foliage turns yellow, when watering should be wholly discontinued, and the bulb allowed to rest.

Miniature hyacinths, now so popular, are only matured small roots of named hyacinths, which bloom finely for their size, and are well adapted for parlor culture.

PROPAGATION.

Hyacinths are propagated by offsets, by cross-cuts, by hollowing, and by seed.

By Offsets. — The little bulbs, or offsets, should not be pulled off of the parent bulb, but all should be planted together; and, when the offsets have produced a stool or root-base, they may be removed, and treated like old bulbs.

By Cross-cuts. — Choose the strongest and healthiest bulbs, and make four cross-cuts in the root-end half-way up the bulb. This should be done when the bulb is taken up in June. It should then be treated like the other bulbs;

and the same autumn the cross-cuts will open pretty wide, and send out young bulbs at the cut scales. They must be planted in this state by themselves, and, the next year, are separated and trimmed. While they are increasing in size, very little foliage, or none at all, appears on the surface of the beds, as the old bulb has no longer any influence, and the young ones only exert their strength towards their own increase.

By Hollowing. — This is usually done in August, if the weather is dry. The manner is as follows: Place the thumb on the root-end of the bulb, and cut round it with a sharp knife, hollowing out the plate, or root-end, as far as the middle of the bulb; and, when the knife has passed in a circular direction round the bulb, be careful to take it out again where the incision began; or rather so make the cut, that the plate, extending half-way into the bulb, may fall out of itself. As this operation causes a great deal of moisture to flow from the bulb, and there is danger of rot, it should not be undertaken in moist weather. The hollowed-out part of the bulb should not be touched, but be placed on dry sand on a board, and turned to the sun. After lying some time, the heart, which extends as far as the point of the bulb, and which was not removed when the bulb was

hollowed out, becomes detached by the heat of the sun, and may be removed. After being properly dried, the bulbs are planted as other bulbs.

When the operation proves successful, a great many young bulbs are obtained ; but it generally takes four or five years to bring them to perfection, while those obtained by cross-cuts mature in three years. Like those obtained from cross-cuts, they produce no leaves the first year.

By Seed.—Many varieties of hyacinth ripen seed freely, which may be sown in pans of prepared soil when ripe, and nursed in a cold frame till the seedlings are large enough to be planted out in beds. Seedlings bloom the third or fourth year. By the three former operations, approved varieties are perpetuated ; by the latter, new varieties produced.

Of other species of hyacinth, there is *H. amethystinus*, a charming little plant, with blue bells, a native of Spain, introduced in 1759, but very rare, and probably not hardy ; and *H. spicatus*, an insignificant plant, with white-and-blue flowers, a native of Greece, and not hardy, introduced in 1835, flowering in February.

The following list of fine hyacinths is compiled from the best English authority. Those marked with a star, and all

the single varieties, are best for early forcing, and culture in water.



DOUBLE BLUE.

Laurens Koster. Indigo ; bells large, closely arranged.

Van Speyk. Light blue, striped with deep blue ; fine spike, large bells.

* Paarlboot. Bright pearly blue ; fine bells, and spike.

Pasquin. Pale blue ; fine spike, large bells.

* Comte de St. Priest. Light blue ; fine bells, large spike.

Bloksberg. Fine marbled blue ; large bells.

Garrick. Intense deep blue ; good spike, with large bells, closely arranged.

Rudolphus. Sky-blue ; good truss.

Prince Frederick. Porcelain-blue, or lilac-shaded ; large bells.

Sir Colin Campbell. Light-shaded blue ; immense bells ; fine spike.

Bouquet Constant. Porcelain-blue ; good bells and spike.

Othello. Very dark ; small spike, but large bells.

DOUBLE RED.

* Duke of Wellington. Pale rose ; large bells, good spike.

Jenny Lind. Deep rose ; good bells, and spike.

Milton. Fine deep red ; large bells, good spike.

Czar Nicholas. Rose ; good spike, fine bells.

* Waterloo. Pink at first, changing to deep red ; fine spike, and bells.

Noble par Mérite. Rose ; striped carmine, large spike, immense bells.

Groot Voorst. Pale rose ; fine bells.

* Princess Royal. Fine rose, striped with deep pink ; fine bells, good spike.

Kohinoor. Salmon ; fine bells and spike, perfect form.

* Bouquet Royale. Deep rose, with pink eye.

Regina Victoria. Rosy pink ; fine large spike.

Susannah Maria. Salmon-rose ; fine spike.

DOUBLE WHITE.

* La Tour d'Auvergne. Pure white ; large spike.

Ne Plus Ultra. Large bells, and spike.

* Prince of Waterloo. Very fine ; large bells, and spike.

Sir Bulwer Lytton. White, purple eye ; large spike, and enormous bells.

Anna Maria. Blush, with pink eye.

Sceptre d'Or. Pure white.

La Vestale. Beautiful white ; good spike.

Don Gratuit. Large bells ; good spike.

Triomphe Blandina. Blush ; deep-pink eye.

La Déesse. Fine spike ; medium bells.

SINGLE RED.

Josephine. Brilliant vermilion ; the best red ; good spike, and bells.

Cavaignac. Salmon ; deep rose, stripes.

Howard. Orange-crimson.

Circe. Pink, striped with carmine.

Madam Hodgson. Pale pink ; very fine spike.

Pelissier. Scarlet ; immense spike.

Sultan's Favorite. Pale rose ; pink stripes.

Lady Sale. Deep red, suffused with purple ; light eye.

Victoria Alexandrina. Intense crimson ; large bells,
fine spike.

Queen Victoria. Pale pink ; bright-red stripes.

Von Schiller. Salmon-pink ; very fine.

Florence Nightingale. Pale pink ; carmine stripes.

SINGLE BLUE.

Bleu Aimable. Violet ; shaded blue, fine.

Argus. Blue, white eye ; tube indigo blue.

Charles Dickens. Gray ; shaded blue.

Leonidas. Clear blue ; fine.

Regulus. Pale blue ; fine bells.

Madame Coste. Deep blue ; fine spike.

Grand Lilas. Azure-blue.

Thorwaldsen. Marbled blue ; immense bells.

Porcelain Sceptre. Porcelain-blue ; deep shaded.

Nimrod. Light blue ; fine spike, good bells.

SINGLE WHITE.

- Queen of the Netherlands. Fine white.
Madame van de Hoop. Fine bells, and spike.
Snowball. Pure white ; fine bells, and spike.
Paix de l'Europe. Pure white ; small bells, but fine.
Fair Maid of Denmark. Splendid white ; fine bells.
Alba Maxima. Pure white ; large bells, and spike.
Victoria Regina. Fine white ; very good.
Miss Burdett Coutts. Creamy blush ; very fine.
Gigantea. Blush ; fine spike.
Lady Franklin. Blush ; immense spike.
Grande Blanche Impériale. Blush ; rose stripes.
Seraphine. Blush ; immense spike.
Elfrida. Creamy blush ; large bells.

SINGLE BLACK.

- Gen. Havelock. Purple, changing to black.
Prince Albert. Fine bells on large spike.
La Nuit. Deep purple black ; fine.
Von Humboldt. Purplish black ; white eye.
Lamplighter. Purplish black, with white eye.

SINGLE YELLOW.

Ida. Fine yellow.

San Francisco. Deep yellow.

Victor Hugo. Fine bells, and spike.

Duc de Malakoff. Straw-color, with a stripe of lake on each segment.

Aurora. Straw-color; the tube splashed with pink, the segments with pink of a deeper hue on stripes.

Koning van Holland. Creamy yellow, shaded with reddish orange.

All these single varieties force well, and will do well in water. Perhaps the earliest hyacinth is L'Ami du Cœur, single red.

THE PROPERTIES OF A GOOD HYACINTH, AS A FLORIST

FLOWER, ARE, —

1. Each pip, or flower, should be round, and not ragged.
2. The petals should be broad, thick, blunt at the ends, not pointed, and reflexed enough to throw up the centre well.

3. The foot-stalk should be strong, and hold the flower out stiff in a vertical position, that is, facing the spectator ; and by no means weak, to allow the pip to hang with the face sloping towards the ground. The foot-stalks should also be of a length to make the pips touch each other, and no more.

4. The pips should be large : for, unless the pips be large, they cannot touch each other without very short foot-stalks ; and the flowers would be so close to the stem, that the truss itself would be no size.

5. Double flowers should have the rows of petals above each other very regularly imbricated, so as to throw up the centre.

6. The outer petals, therefore, of a double flower, need not reflex, and should not reflex, so much as a single one, because the centre is raised by the second and third rows of petals.

7. The spike should be bold, round, compact, and pyramidal, with a number of flowers at the bottom, gradually diminishing to a single flower at the top.

8. The flower-stem should be very strong and upright ; and no part of it should be seen from the lowest flowers to the top, in consequence of the closeness of the pips to each other.

9. The colors should be bright, clear, and dense, what-

ever the shade ; and any better approach to scarlet, blue, or yellow, than those shades we now possess, would be highly esteemed : flowers with dark eyes, very clear outsides, and those with striped petals, would be held to be better than selfs in general, but would give no point against form.

THE SCILLA.

This is a lovely genus of small bulbs, with blue, white, or pink flowers. They are mostly very early flowering, and are very effective as borders for bulb-beds or in masses.

The prevailing color is blue. The flowers are produced in spikes, composed of from six to twelve pendent bells. The bulbs are generally hardy enough to endure the winter with the protection usually given to a bulb-bed, and require no further treatment than to be planted from one to two inches deep in October or November, in a rather light soil : that usually prepared for bulbs suits them well. When once planted, they should not be disturbed oftener than is required for division.

As the individual bulbs are small, they should always be grown in masses, or in double or triple lines, as otherwise they are not effective. Each species should also be planted by itself.

Scilla Siberica is one of the most beautiful; and no word can convey an idea of the brilliant blue of the blossoms.

Scillas are well adapted for growth in pots, in earth or sand, and only require to be planted in November, kept in a dark, cool place until they have made plenty of roots, and then gradually inured to light and heat. They look better in pans than in pots; and the bulbs should be planted about an inch deep, and about the same distance from each other every way.

The principal varieties are

SCILLA SIBERICA. — This species is one of the hardiest and best. As its name implies, it is a native of Siberia. The flowers are brilliant, intense blue, and produced, one to four, on a short spike.

SCILLA PRÆCOX. — This species has flowers of the same brilliant blue color as the last. It is a native of Germany, and more tender than *S. Siberica*. It was introduced in 1790, but is not common.

SCILLA CERNUA. — This species bears a great resemblance to the English harebell (*Hyacinthus, Scilla, or Myogalum, non scriptus*), but differs slightly botanically. It is a native of Spain, and has been long in cultivation. The

flowers are drooping, pale pink, or purple. It requires winter protection in the Northern States.

SCILLA CAMPANULATA.—This is one of the finest species; common and hardy, although a native of Spain. The plant is very floriferous and effective: the color is blue; but there are pink and white varieties, of which the latter is the best white squill in cultivation.

SCILLA PATULA.—This species has dark-purple, pink, or white flowers, and greatly resembles *S. cernua*, but, unlike it, has flowers all round the spike. It is a native of Spain, and is generally hardy.

S. AMÆNULA has starry, blue flowers, which are produced before the leaves. It greatly resembles *S. Siberica*, and is a native of the north of Europe. The bulb produces several flower-scapes, which are from one to three flowered.

S. AMÆNA.—This is one of the best species, and, though a native of the Levant, is generally hardy. The flowers are bright blue, produced on an erect spike. Introduced in 1596.

S. VERNA.—This species is a native of England. The flowers are blue, pink, or white, and fragrant. They do best in moist, sandy soil.

S. AUTUMNALIS.—Another British species, growing freely in sandy soil. Flowers pink in September.

S. BIFOLIA. — A very pretty species, native of France, with blue flowers, and white and pink varieties, all of which are desirable. It requires no care beyond planting in sandy loam.

S. PERUVIANA. — A fine species, native of Italy and Spain. It has blue or white flowers, in large, erect trusses. The soil must be light and sandy, and plenty of water must be given when in growth. It is probably only half-hardy.

SCILLA ESCULENTA. — This plant is a native of Missouri, and produces a spike of pretty blue flowers. It is not hardy in New England.*

The following species are only valuable in a collection. Most of them are tender, and none particularly desirable.

S. umbellata. — Native of Pyrenees, introduced in 1822; flowers blue.

S. Lilio hyacinthus. — Native of south of Europe, introduced in 1597; flowers blue.

S. brevifolia. — Native of Cape of Good Hope, introduced in 1811; flowers white.

S. corymbosa. — Native of Cape of Good Hope, introduced in 1793; flowers pink.

S. Italica. — Native of Switzerland, introduced in 1605; flowers purplish.

* See *Camassia esculenta*.

S. Lusitanica.—Native of Portugal, introduced in 1777; flowers blue.

S. hyacinthoides.—Native of Madeira, introduced in 1585; flowers lead-color.

There are other species of little cultural value.*

THE URGINEA.

This plant is also known as *Scilla maritima* and *Ornithogalum maritimum*. It is a native of the shores of the Mediterranean, and is of some officinal value.

It is not uncommon in cultivation, but is not hardy. The bulb is large; the flowers, greenish-white, on a very long spike, are produced in summer; and the foliage grows during the winter. The bulbs should be grown in sand; but they are hardly worthy of culture.

THE MYOGALUM.

This name has been given to the plant commonly known as "British harebell," and botanically as *Scilla*, or *Hyacinthus non scriptus*.

The flowers are blue nodding, and somewhat resemble a

* See "Garden Flowers."

hyacinth, and also are very like those of *Scilla cernua*. It is an elegant little flower, requiring very little care, save to be planted in a damp, shady spot, and left to take care of itself. It is a well-known wild-flower in England, but is little known in this country. The name "harebell" is a strange misnomer; although the flowers have a slight resemblance to the campanula, usually so called. There are varieties with pink and white flowers; but they are not as desirable as the species. The plant would probably prove hardy with slight protection.



THE NARCISSUS.

This is a very extensive family of well-known and popular garden-flowers. Their culture is very simple, as they

thrive in any good garden-loam, and need little care after planting. All the species are hardy in England, and most of them thrive out of doors in the Middle and Southern states; but many of the most beautiful, and especially the polyanthus group, are not hardy enough to perfectly stand a New-England winter, though they often survive uninjured.

The hardy species should be planted in clumps, the bulbs about two inches apart each way, and three inches deep, in good garden-soil, in October; and need not be disturbed oftener than once in three or four years, and not then unless they have crowded each other by the production of offsets. If the soil is wet, they are benefited by the addition of a little sand placed around each bulb. They all propagate well by offsets, and may also be increased by seed, which, in most species, ripens plentifully.

Many species, especially those of the polyanthus tribe, are often grown in the house for winter-flowering. They may be successfully grown in water, sand, or earth; and require the same treatment as hyacinths.

The jonquil is a species of narcissus, easily grown in the house or garden, and always a favorite for its bright, fragrant flowers. The chief species of narcissus are —

N. POETICUS. — This very common and beautiful species is a native of Southern Europe. There are many varieties, including double and semi-double; but all are easily distinguished from other species by the deep-purple ring in the centre of the color, round the margin of the cup. The flowers are solitary, white, with a yellow cup, bordered by red, purple, or orange.

This species needs a deep, rather moist soil, and in such never fails to expand its flowers. In poor soils, the flowers are very apt to dry up in the bud-sheath, which they do not appear to have strength to break. The double varieties are more liable to this disease than the single. All the varieties are perfectly hardy, and, once planted, may remain undisturbed for years.

N. BIFLORUS. — The origin of this species is unknown: it has, however, been a garden-flower for several hundred years. It resembles the species last described, but is readily distinguished by having two or three flowers on a stem, and by the rim of the cup being white. The flowers are handsome, and very fragrant. The species and varieties are perfectly hardy, though not very common.

N. GRACILIS. — A common and pretty pale-yellow species, with a deeper-colored variety: both hardy, and growing freely in any garden-soil.

N. BULBOCODIUM.—This is the well-known and handsome hoop-petticoat narcissus. The flowers are bright yellow, with wavy margin, and are very ornamental. Though a native of Portugal, it generally proves hardy, but needs to be a little favored by planting it in a sheltered situation.

There is another species nearly allied to this, known as *N. Cantabricus*, or *Corbularia albicans*, or *Cantabricus*, which has white flowers, and which is desirable.

N. TENUIFOLIUS is a closely allied species of smaller growth, which is rather tender.

N. PSEUDO-NARCISSUS.—This is the common daffodil, too well known to need description. It sports into many varieties, and is usually found in a double form. The bulb only requires to be planted in good soil, and to be undisturbed.

N. MINOR.—A pretty little species, with many varieties, as *nanus*, *pumilus*, *minimus*, all with bright-yellow flowers and dwarf habit, perfectly hardy, and very ornamental; native of Spain, but long an inhabitant of the garden.

N. BICOLOR.—This species differs from the common daffodil by the difference of color between the cup and remainder of the flower; the former being all shades of

cream or white in different varieties, the latter being yellow. The stalk is round, while that of the common daffodil is flat. It is hardy, and only requires simple garden-culture.

N. MOSCHATUS. — A pretty species, with whitish flowers; in some of the varieties, very drooping; often known as white Spanish daffodil. It is hardy, but needs rich soil to bloom well. Introduced from Spain in 1759.

N. MAJOR. — The species commonly called great yellow Spanish daffodil has been very showy in our garden for a number of years. It thrives in a deep sandy loam, and is a great improvement on the common daffodil.

N. MONTANUS. — This is a beautiful species, with white, graceful, drooping flowers. It is of rather difficult culture, needing a deep, rich, moist soil, and a sheltered situation. It is a native of the Pyrenees, and has long been known as a garden-flower.

N. JONQUILLA. — This name is from *juncus*, a diminutive, signifying “little rush;” and the species is one of the most popular of the family. The flowers of all the varieties are bright yellow, fragrant, and freely produced. All are well suited for window-plants, as the flowers seldom fail to expand, and continue a long time in perfection. A bulb-case

planted with jonquils is a charming winter ornament for the parlor.

N. TAZETTA. — Under this head we must include all the varieties of the polyanthus narcissus. The name is a diminutive, from *tazza*, “a cup;” and its application is obvious. The many varieties are all handsome, and only differ in the colors of the cup and petals, and in sturdiness of growth. The earliest variety is *Gloriosa*, white, with yellow cup. Other fine varieties are *Bazelman major*, white, yellow cup; *Bazelman minor*, white and yellow; *Bouquet-triomphant*, white, orange cup; *Grand monarque*, white, citron cup; *Grand primo*, white, citron cup; *Grand soleil d’or*, yellow, orange cup; *Luna*, pure white; *Newton*, yellow; *Queen of the Netherlands*, very large, white; *Staten-General*, lemon and yellow.

When grown in the open air in New England, these bulbs are apt to start in the autumn, and have the shoot killed in the winter. The only remedy is to take them out of the ground when the foliage has decayed, and keep them in a cool place till November, when they may be replanted. They also need a sheltered situation, and to be well covered with leaves during the winter.

For house-culture they are charming subjects, requiring the same treatment prescribed for hyacinths.

N. ITALICUS. — This pretty species and its varieties are not hardy. The flower is white and very pretty, but is seldom seen in cultivation.

N. PAPYRACEUS. — This species, usually known as the paper-white narcissus, is very ornamental, but not hardy. It, however, does well in the greenhouse, and blooms very early in the winter. The variety called "Double Roman" has peculiar yellow and white mixed flowers, and blooms about Christmas. It is very valuable as a parlor-plant and for early forcing.

There are many other species,* — Loudon enumerating about fifty, — and innumerable seedling varieties: all are worthy of cultivation, and will well repay the care of the amateur. The fanciful divisions of the family proposed by some botanists have not been adopted, and all are now known as narcissus.

* See "Garden Flowers."



VII.

THE SNOWDROP, LEUCOJUM, CROCUS.

THE SNOWDROP.



LONG before the balmy breezes of spring remind us that it cannot be always winter, the snowdrop wakens from its sleep, and gladdens our eyes by its simple beauty and sweet perfume. Later in the season, when the garden is gay with flowers, it would be almost unnoticed : but for long, dreary days, it is the flower of spring ; and, as such, we love and cherish it.

The snowdrop thrives in any good garden-soil enriched by well-rotted manure or leaf-mould. It will live and bloom in almost any situation, and will endure a great amount of hard treatment before it is finally killed : but few flowers better repay care and good culture. The bulbs should be planted in September or October, the earlier the better, to enable them to make good roots and growth before the

ground freezes up. They should be set about two or three inches deep, and about an inch apart, in triple lines or in clumps, as, if planted singly, they are not conspicuous. The bulbs should not be kept long out of the ground, and are not benefited by frequent transplanting. Some writers advise annually replanting them after the foliage decays, and the removal of all offsets. This may be advantageous if increase is the object; but our experience has shown that it is best to disturb the clumps only when the increase of offsets renders them too large or crowded, or when the bulbs grow out of the ground, which they do in a few years in a border, unless the soil is annually top-dressed.

The flowers of all species appear very early in the season; generally, however, in New England, not before the first of February, even in most favorable situations and in most sheltered places; and continue in perfection a very long time, closing in cloudy, inclement weather, and expanding in sunshine. By planting in different exposures, a succession may be had from February to May. The single variety expands earlier than the double, and is followed by the large Crimean snowdrop, which is larger than either. The single snowdrop is a native of England, and is found in shady woods where there is a rich deposit of vegetable

matter or leaf-mould. The double form is a garden variety. The species are

G. NIVALIS. — The single snowdrop with double variety; and

G. PLICATUS. — The Crimean or Russian snowdrop, which is twice as large as the common species, of the same color, with broad leaves, and flower-stems nine inches high.

THE LEUCOJUM.

All the species of this plant are commonly known as snowflakes, and differ but little save in the time of blooming.

The bulbs are rather large, and only require to be planted in good garden-soil, where they take care of themselves, and bloom freely every year. They propagate readily by offsets, and also ripen seed: almost all are hardy enough to stand a New-England winter. The species are

L. (ERINOSMA) VERNUM. — A very pretty bulb, much resembling the snowdrop, but flowering a month later. It is a little tender, and needs a rather peaty soil to bloom it successfully. It is a native of Germany and Italy, and has been in cultivation since 1596.

There is a variety sometimes called *L. Carpathicum*, which differs from the species in having yellow spots on the flower instead of green, and in having two flowers on one stalk.

L. ÆSTIVUM. — This pretty plant is common in gardens. The flowers are white, with bright-green spots, the foliage having a yellowish tinge. It is a native of England and other parts of Europe, and is perfectly hardy in any situation.

L. pulchellum is only a variety of this species.

The other species of *Leucojum* have been called *Acis* by many botanists, and are readily distinguished from those above described by the narrowness of the leaves and the smallness of the flowers. They are by no means as ornamental as those above described, and are less hardy.

L. (Acis) AUTUMNALIS. — This is a pretty little species, with pink flowers, produced in autumn before the leaves. It is a native of Spain and Algiers, and requires greenhouse treatment.

L. (Acis) TRICHOPHYLLUM. — This is a small species, growing only a few inches high. The flowers are white, and produced in spring. It requires greenhouse culture and a sandy soil.

L. (ACIS) ROSEUM.—The flowers of this species are rose-color, drooping; produced, three or four in succession, in autumn. It requires greenhouse protection, sandy loam, and to be kept hot and dry when at rest.

A species called *grandiflorum* has large, white, drooping flowers.

THE CROCUS.

This pretty spring-flowering plant is common in every garden; and like the snowdrop, which it succeeds in its period of flowering, it will endure a vast amount of ill treatment, but is none the less benefited by careful culture.

The crocus is primarily divided into two classes,—those flowering in spring and those blooming in autumn. Of the number of species, there is great question among botanists. Loudon enumerates sixteen. Mrs. Loudon, in her charming work on “Bulbs,” speaks of ninety species and varieties. Sweet, in his “Catalogue of Plants,” gives but twenty; and the catalogues of modern florists almost ignore the species, but give us scores of seminal varieties. Indeed, such has been the improvement in this flower since it came into the culturist’s hands, that the varieties exceed in beauty any of the species, most of which are now found only in botanic

gardens or with amateur collectors, if, indeed, many are not lost to cultivation. The crocus is a native of Europe and Middle Asia, but has from a very early period been domesticated in the garden.

The culture is only to plant them in a rich, light, damp soil, but where no water will stand around the bulbs, and leave them to take care of themselves. They are, however, benefited by an annual top-dressing of well-rotted manure.

The bulbs should be planted three inches deep, and should not be disturbed oftener than once in three or four years, and then only if they are growing out of the ground.

When it is necessary to remove them, it should be done as soon as the foliage dies; and the bulbs should be immediately replanted. There are very few hardy bulbs that are improved by the annual drying and transplanting process.

A bed of crocus does not arrive at its full beauty until the second or third year after planting; and, after that, it will continue to improve for many years, if the bulbs were not originally planted too close together, and thus become crowded. The proper distance to plant the bulbs is one inch apart each way. It is to be remembered, however, that the crocus grows and increases upwards, and not laterally.

Crocus do not thrive well under the shade of trees, as they do not seem to mature their foliage before the sunlight is shut off from them.

Imported bulbs should be planted as soon as possible in the autumn ; the earlier the better.

There is no better plant for clumps, lines, masses, or even whole beds, for the early spring-garden ; and very striking effects may be produced by judicious planting. With this flower, as with most others, there is nothing gained by mixing varieties or colors : each color should be in a mass or line by itself, and should contrast strongly with those on either side. We clip the following directions for planting beds from an article in an English magazine : —

“ Very fine beds may be formed by planting a double row of *Mont Blanc*, white, six inches from the edge ; six inches from that, again, a double row of *Prince Albert*, blue ; then, at a like distance, *Dutch crocus*, yellow ; a fourth, of *La Majesteuse*, striped ; a fifth, of *Othello*, dark violet ; and *Giant Yellow* in the centre. This will be splendid for a circular bed seven feet across. For a border six feet wide, we have the first row six inches from the edge ; a double one, white, *Queen Victoria* : the others being, second, *Cloth of Gold*, yellow ; third, *Garibaldi*, purple ; fourth,

Aletta Wilheimena, white, flamed with violet ; fifth, *New Large Yellow* ; sixth, *Vulcan*, deep purple. The second row is one foot from the first, and so on ; early tulips being planted between each. Again : we have a border twelve feet wide, to be planted as follows, in twenty-four rows : *Queen Victoria*, white ; *Captain Cook*, purple ; *Cloth of Gold*, yellow ; *Argus*, violet, white margin ; *David Rizzio*, dark purple ; *Sulphureus*, brimstone-yellow ; *Mont Blanc*, white ; *Prince Albert*, purple ; *Large Yellow* ; *Cloth of Silver*, white, purple stripes ; *Ne Plus Ultra*, blue, tipped with white ; *Yellow Dutch* ; *Princess of Wales*, dark purple ; *Caroline Chisholm*, white ; *New Large Yellow* ; *Albion*, blue, white-and-blue stripes ; *Van Speyk*, feathered, blue and white ; *Yellow Dutch* ; *Lord Raglan*, dark blue ; *Diana*, white ; *Cloth of Gold* ; *Lilaceus superbus*, light violet, white margin ; *Versicolor*, white, purple veins ; *Large Yellow* ; *Grande Vedette*."

If, after blooming, the crocus-bed is wanted for other flowers, the bulbs may be removed in clumps, with balls of earth, to a reserve garden, after blooming, and, in autumn, be retransplanted to their original position. A good plan, however, is to plant the crocus in double rows ; the first, six inches from the edge of the border, and the next a foot from the edge, and so on ; which leaves space for early

tulips, which are done flowering in time to have their places supplied by bedding-plants : and thus the crocuses are not disturbed, and their foliage renders the tulips more effective.

For house-culture the crocus is well adapted, and does well grown in earth or water : bloomed in a pan of white sand, the yellow and purple varieties are very pretty.

In England, there are glasses made especially for crocus culture ; but we do not remember to have seen them in this country.

Crocus, snowdrops, and similar bulbs, may be had in bloom about Christmas by taking up the most promising clumps from the border about the last of October, and potting them in small pots, in leaf-mould. Water them, and keep them in a cold frame till well established ; then place them in a cool greenhouse, on shelves near the glass, where they can have plenty of air in pleasant weather. Water them well ; and, about the last of November, remove them to a light, airy shelf in a greenhouse, where the thermometer registers 50° at night. If they do not advance sufficiently rapidly, increase the heat ; but always bear in mind that air and light, and not too high a temperature, are the conditions of success. Crocus are easily raised from

seed, which ripens freely. The seeds should be gathered just before the pods burst, kept about a month in the pods, and then be sown in drills in the garden. If the soil is rich (and it cannot be too rich), many will bloom the third year. The crocus seeds under ground; the pods coming to the surface only when the seeds are ripe.

Some of the species which are the parents of the garden varieties are

C. biflorus.—This species, commonly known as the Scotch (though why would be difficult to say) or twin-flowering crocus, is a native of the Crimea, and is very hardy, and early flowering. It will grow with little care, but is impatient of removal. The flowers are twin; of a white, striped with purple; and remain long in perfection.

C. vernus.—This is the wild English species, though probably only naturalized, and not indigenous. The flower is pale lilac, varying to white and purple, but never yellow. It ripens seed freely.

C. versicolor.—This is the parent of many of the fine seedling varieties. The flower is purple and white, and very fragrant.

C. Susianus.—The cloth-of-gold crocus has been an inhabitant of the garden for many hundred years. The

flowers are yellow inside, with dark lines on the outer part of the petals : they expand early in spring, after the Scotch crocus, and before the larger-flowered varieties. It is a native of Southern Europe.

C. luteus. — This is the well-known large yellow crocus, so effective from its brilliant color on sunny days in spring. It is a native of the Levant, but has been in cultivation since 1620.

In England, this species, as indeed all yellow crocus, is attacked by sparrows, who, in a pure spirit of mischief, tear the flowers to pieces, and spoil the beauty of the bed. In this country, however, we experience little trouble from this cause. There are many other species, among which we may mention *C. minimus*, *reticulatus*, *lagenæflorus*, *sulphureus*, *suavolens*, *Imperati*, and the autumn-flowering species, *sativus*, or saffron crocus, producing the saffron of commerce, which is the stigma of the flower ; *C. serotinus*, *speciosus*, and *autumnalis*, which differ from the spring-blooming species in the season of flowering, and require the same general culture.



BEING wholly destitute of the delicate grace of many bulbs, the tulip is ever attractive from its beauty, and brilliancy of color, and delicate markings. Probably no flower was ever a subject of commercial speculation, or rather gambling, to such an extent; and the history of the "Tulipomania" in the latter part of the sixteenth and early part of the seventeenth centuries, when as much as five hundred pounds were paid for a single bulb, is a most readable chapter of extravagant delusion. Although the mania has long since been seen in its true light, yet, even at the present time, larger sums are paid for tulips than for any other

bulb ; and the raiser of a new and really fine tulip is sure to find a profit in the operation.

All our garden tulips, that is, "show varieties," are the offspring of *T. Gesneriana*. The other species, however, are very curious, and some very beautiful, and are well worthy of a place in the garden.

While volumes have been written upon the culture of the tulip, its successful growth is by no means difficult. The beds are usually prepared four feet wide, and excavated about thirty inches deep : about six inches of well-rotted horse or sheep dung is placed in the bottom, and the bed filled up, about four inches above the former level, with light rich soil. In this the bulbs are planted in October, six inches from each other, and so deep that the point of the bulb is two inches below the surface ; the holes being made with a common dibble, and filled in with fine sand, in which the bulb is to be planted.

The bulbs should be set with reference to their habit ; the tall growers in the middle, and those of lower growth on the outside. During winter, the bed should be covered with a layer of coarse litter or tan, to protect the bulbs from severe frost. This should be removed in early spring, and the surface of the ground gently stirred. As the

plants come into bloom, they should be protected by an awning, to preserve them longer in perfection. After the flowers have faded, the awning should be removed, and the plants allowed to ripen the foliage. When this is done, the bulbs should be taken up carefully, dried, and kept in a dry, cool place until the season for planting again arrives. Tulips will, however, grow in any deep, rich, light soil. They are very impatient of standing water, and do not improve by being left in the ground from year to year: indeed, if not annually taken up, they “run out,” to use the gardener’s term; that is, the choicer and more delicate varieties die out, and the stronger and coarser revert to the old red color. Much that is curious might be written upon the disappointed hopes of the raisers of seedling tulips; for the chances of success are very small, and those of failure very great. Seedlings bloom in about five years, and the modes taken to make them “break” are very curious. Tulips are divided into three classes, — bazarres, by-bloemens, and roses. In the former, the ground-color is yellow; and in the two latter, white. A chief point of perfection is the purity of this ground-color: if at all marked or cloudy, the flower is poor. The base of the flower inside should be clear; that is, none of the marking should

run down to the bottom of the cup. The stamens should also be white or yellow, according to the class.

Each class is further divided, as regards marking, into "flamed and feathered." If the marking of the flower is confined to the edge of the petals, it is feathered; but, if a dark broad stripe runs down the centre, it is flamed. In every case, the colors must be well defined.

THE PROPERTIES OF A GOOD TULIP, AS A FLORIST'S
FLOWER, ARE,

1. The cup should form, when quite expanded, from half to a third of a hollow ball. To do this, the petals must be six in number, broad at the ends, smooth at the edges; and the divisions between the petals must scarcely show an indenture.

2. The three inner petals should set close to the three outer ones; and the whole should be broad enough to allow of the fullest expansion without quartering, as it is called; that is, exhibiting any vacancy between the petals.

3. The petals should be thick, smooth, and stiff, and keep their form well.

4. The ground should be clear and distinct, whether

white or yellow. The least stain, even at the lower end of the petal, would render a tulip comparatively valueless.

5. Roses, bybloemens, and bizarres are the three classes into which tulips are now divided. The first have a white ground, and crimson or pink or scarlet marks; the second have white grounds, and purple, lilac, or black marks; and the last have yellow grounds, with any colored marks.

6. Whatever be the disposition of colors, or marks, upon a tulip, all the six petals should be marked alike, and be, therefore, perfectly uniform.

7. The feathered flowers should have an even, close feathering all round; and whether narrow or wide, light or heavy, should reach far enough round the petals to form, when they are expanded, an unbroken edging all round.

8. If the flower have any marking besides the feathering at the edge, it should be a beam, or bold mark down the centre, but not reaching the bottom, or near the bottom, of the cup: the mark, or beam, must be similar in all the six petals.

9. Flowers not feathered, and with flame only, must have no marks on the edges of the flowers. None of the color must break through to the edge. The color may be

disposed in any form, so that it be perfectly uniform in all the petals, and does not go too near the bottom.

10. The color, whatever it may be, must be dense and decided. Whether it be delicate and light, or bright or dark, it must be distinct in its outline, and not shaded or flushed or broken.

11. The height should be eighteen to thirty-six inches: the former is right for the outside row in a bed, and the latter is right for the highest row.

12. The purity of the white and the brightness of the yellow should be permanent; that is to say, should stand until the petals actually fall.

While a bed of choice tulips may be very expensive, a fine show may be made with but a trifling outlay. The following lists are given by the best English authority, — the one, dividing the bulbs into classes; the other, arranging them according to color.

Those mentioned in the following list are not expensive, and are of vigorous constitution.

BIZARRES.

Albion, Bizarre, Cato, Crusader, Duke of Devonshire, Duke of Sutherland, Dr. Horner, Fabius, Garrick, Ibra-

him Pacha, Lord Raglan, Marshal Soult, Mr. F. Perkins, Omar Pacha, Pilot, Polyphemus, Royal Sovereign, Vivid.

BYBLOEMENS.

Alexander Magnus, Addison, Bloemast, Chellaston Beauty, David, Earl of Haddington, General Bamoselde, George Glenly, Grace Darling, Lord Denman, Maid of Orleans, Queen of Violets, Triomphe de Lisle, Victoria Regina.

ROSES.

Aglaia, Baron Gesdoff, Countess of Wilton, Camise de Croix, Claudiana, Duchess of Kent, La Belle Nannette, Lady Stanley, Madame Vestris, Naomi, Undine, Ponceau de très blanc, Triomphe Royal.

Many of the self or one-colored tulips are very showy in masses ; and the double varieties, if of good color, are very effective. The parrot-tulips are hybrids between *T. cornuta* and *T. sylvestris*, and are well worthy a place in the garden.

The charming early Duc Van Thol, both in the single and double state, is an indispensable ornament of the early spring-border.

Some of the smaller early tulips force well in sand and earth, requiring the treatment already prescribed for narcissus and hyacinths. We have in our garden a charming little tulip of a vivid yellow, deliciously fragrant, and producing two or three flowers on a stem, which we received from Holland a few years since under the name of *T. fragrans*. It is perfectly hardy, flowers freely, and remains long in perfection.

The following list will be found useful to those who plant tulips for general effect of color : —

YELLOW.

Canary Bird. — Rich pure yellow ; nine inches high.

Pottebakker Yellow. — Yellow self ; nine to twelve inches.

Duc Van Thol. — Yellow, early, and dwarf ; four to six inches.

Yellow Prince. — A good yellow ; nine inches.

Thomas Moore. — Orange, distinct ; nine inches.

WHITES.

Pottebakker. — White, very fine ; nine to twelve inches.

Luna. — A fine variety.

Queen Victoria. — Small, fine form, white and crimson ; nine inches.

Jagt Van Delft. — White self, fine form ; nine inches.

La Laitière. — White, with water-blue tint ; nine inches.

SCARLET.

Typhon. — Crimson-scarlet, fine ; nine inches.

Duc Van Thol. — Scarlet ; six inches.

Cramoisi fidèle. — Intense scarlet.

Couleur Cramoisie. — Crimson-scarlet.

Vermillon brillant. — The best scarlet ; six to nine inches.

La Belle Alliance. — Rich crimson-scarlet ; six to nine inches.

BLUE SHADES.

Florida. — Purplish violet ; nine inches.

Berangaria. — Purple, with a little mauve.

Archas. — Violet-purple, lilac belt.

Caiman. — Violet or puce, lilac margin.

La Plaisante. — Violet, slight rosy tint.

Wouverman. — Violet-purple.

FEATHERED, STRIPED, AND TINTED.

Duc Van Thol. — Red, orange border, early; four to six inches.

Keizerkroon. — Yellow ground, flaked with vivid scarlet.

Standard Royal. — White ground, flaked with carmine.

Alida Marie. — White tipped, and flaked with cerise; very fine.

Bride of Haarlem. — White, bordered with crimson.

Rosa Mundi. — White-shaded rose.

Rose Luisante. — Rosy crimson, peach edges.

Duc Major. — Rich red, margin orange-yellow.

Rose Tendre. — White feathered, and striped with crimson.

Roi Pepin. — White striped, and flaked with crimson.

Ma Plus Aimable. — Bronzy red, flaked with orange.

Standard of Gold. — Yellow, crimson tip.

DOUBLE TULIPS.

Tournesol. — Scarlet and yellow.

Yellow Rose. — Yellow.

La Candeur. — The best white.

Rex Rubrorum. — Crimson-scarlet.

Imperator Rubrorum. — Crimson-scarlet.

Peony Gold. — Golden-yellow, feathered with crimson.

Couronne Pourpre. — Rich crimson.

Mariage de ma Fille. — White-striped, violet-rose.

Overwinner. — White, barred and feathered, with violet-purple.

Gloria Solis. — Crimson, yellow border.

Duc Van Thol. — Red and yellow.

Among the species of tulips we may enumerate

T. biflora. — The smallest of the genus, with white flowers and yellow centre ; a native of Russia, and perfectly hardy.

T. tricolor. — A fine species, with white flowers, tinged with green and yellow. Native of the Altai Mountains.

T. Celsiana. — A handsome species, with yellow flowers. Native of Siberia.

T. sylvestris. — A common yellow species, with drooping, fragrant flowers. A native of France.

T. oculis solis. — A fine species, nearly allied to *T. Gesneriana*, but easily distinguished by the black centre. A native of Italy and France.

T. suavolens. — This is the well-known Duc Van Thol tulip, so pretty and fragrant in early spring. There are

many varieties, all ornamental in the bulb-border. These tulips are better adapted for forcing than any other species.

T. cornuta. — This is a very hardy species, more curious than beautiful. A native of the Levant, and only requiring to be planted in the border, where it will care for itself.

THE IRIS.

All the plants of this family are ornamental in flower, and of very easy culture. They are divided into two classes, —those with bulbous and those with tuberous roots. The latter will thrive in any common garden-soil, and only need the usual treatment given hardy, herbaceous plants; that is, slight annual manuring when the border is dug in the spring, occasional resetting when the clumps grow out of the ground, and division when the clumps become too large. The former are generally hardy, and should be planted in October, in a light, rich soil, and protected by litter thrown over the bed in the winter. The bulbs should be set about three inches deep, and, every third year, should be taken up, and replanted; as, the new bulb forming under the old, the bulbs grow down, bury themselves, and are lost. They may be transplanted as soon as the foliage

decays, and are freely propagated by seeds and by offsets.

The following is a select list of the tuberous varieties, mostly hybrids from *I. Germanica*, which may prove valuable in making a selection, as the number of varieties now in florists' catalogues sadly puzzle the amateur : —

Nuncio. — Bright yellow, and reddish purple.

Archento. — Bright yellow, and black.

Gysels. — Blue and white, mottled.

Ariadne. — Purple and white.

Ahasuerus. — Light and dark purple.

Gonzales. — Straw, purple, and white.

Proserpine. — Yellow and chocolate.

Reticulata. — White and purple.

Azurea. — Clear blue.

Reticulata superba. — White, purple stripes.

Adonis. — Straw, purple, and white.

Nationale. — Deep purple.

Aurea reticulata. — Yellow, purple, and chocolate.

Duchesse de Némours. — Purple and pearl-color.

Antinöus. — Yellow and purple.

Spectabilis. — Yellow and brownish purple.

Salimon. — Yellow, buff, and imperial purple.

Aurea. — Light yellow.

Julia Grisi. — Purple and pearl.

Louis Van Houtte. — Deep purple.

Speciosa. — Deep purple.

Bougerie. — Purple.

Psyche. — Purple and white.

Chloris. — Mottled, purple and white.

Arlequin melanais. — Purple and white.

Cornelie. — Purple and straw-color.

Harus. — Purple, and brownish white.

Album. — White, purple, and brown.

Murito. — Straw-color and white.

Alvarez. — Straw-color and purple.

Van Geertii. — Purple and brown.

La Tendre. — Yellow, brownish purple.

Victorie. — Lemon-color.

Morpheus. — Purple and white, veined.

Agatha. — Dark purple.

Celestina. — Blue.

Ignacita. — Purple and white.

Reticulata alba. — White, blue-veined.

Fleur de Marie. — Purple and white.

Calypso. — Purple, white, and blue.

Augustissima. — Orange and brown.

Apollo. — Deep purple and white.

A collection of these tuberous species is, in the latter part of June, one of the most effective sights in a garden. They do well, either in small clumps or in masses; and, when the colors are well combined, the effect of large beds is very fine.

Seed is freely produced, and is sown to raise new varieties. The older sorts are propagated by division of the roots in early spring, or when they have made their growth in July.

In addition to the varieties above mentioned, there are hundreds of others of the same class, flowering from the first of June until the last of July, in some of the many varieties.

There is also a class of spring-blooming species, all of dwarf growth, and admirably suited for the edging of spring-borders. The colors of most of these are light or dark blue: the species all bloom freely, and are very hardy, enduring ill treatment and careless planting, and flourishing and blooming in every soil and situation. They seldom ripen seed, but propagate very freely by division of the roots. Indeed, the clumps often increase so fast as to ren-

der division necessary every two years. The foliage is good, and remains green until autumn, though all the growth is made in early spring. Among these early-blooming species we may mention

I. cristata. — Flowers pale blue in May; three inches high.

I. pumila. — Flowers dark blue or white; three inches high.

I. lutescens. — Flowers yellowish white; six inches high.

We have in our garden a most beautiful variety of *I. pumila*, which blooms rather later than the species, and has dark-purple flowers, with a rich velvety lustre, with shadings of orange-yellow.

The species of bulbous iris most commonly grown are

I. Xiphium. — This species, commonly called the Spanish iris, and often found in the shops under the name of *Iris Hispanica*, is perfectly hardy in our gardens. The flowers are very handsome, and of various colors, fragrant, and freely produced. This species propagates itself readily by offsets: it also ripens seed in abundance, and hybridizes freely with the English iris. Indeed, the florists' catalogues give us hundreds of hybrid seedlings, which are indiscriminately called English or Spanish iris.

I. Xiphoides. — The bulbs of this species much resemble the last ; but they are larger and rounder. The flower is large, and very handsome. The plant is of stout habit. Although called the English iris, and sold under the name of *Iris Angelica*, the plant is a native of the Pyrenees ; but it has been in cultivation from a very early period. It propagates very slowly from offsets, but produces seed freely ; and thus the varieties are very numerous. The species and all varieties are perfectly hardy.

I. Lusitanica. — This fine species is somewhat rare, and less hardy than the two last mentioned. The flowers are yellow, buff, and purple, and very handsome. The culture is simple, and similar to the last : only a slight winter protection should be given.

I. Persica. — This is a little gem of a flower, perfectly hardy, and coming into bloom with the early crocus. We can hardly describe in words its delicate and yet striking beauty, nor do justice to the pleasing contrasts of color which it exhibits. The plant is a native of Persia, and yet endures our severest winters without protection.

I. tuberosa. — The snake's-head iris is a fine species, with rich, velvety flowers. It is a native of the Levant, but

will generally endure our winters. The flowers are produced in May.

I. Susiana. — This species, like the last, has roots rather tuberous than bulbous. The flowers are magnificent, and, under careful culture, freely produced. In the greenhouse, it blooms well; and it is hardy enough to survive our winters, but must be taken up as soon as the foliage decays, as, if left in the ground, it makes a very early autumn growth, which is killed by the winter, and the bulb perishes. The soil for this species should be rather sandy.

Besides these, there are some fifty species of iris; and we know of no family of which all the species are so ornamental.* The only culture the iris requires in the garden is to plant it like a tulip, and, after the leaves die, to take it up, as most of the bulbous species slowly sink into the ground by the production of new bulbs, bury themselves, and are lost. This is not, however, the case with *I. Susiana* and the tuberous species. Most of the species may be successfully forced, as prescribed for hyacinths, either in earth or water.

The following are the characteristics of a good iris: —

This flower is composed of three principal and three secondary petals, or divisions. The three principal fall

* See "Garden Flowers."

down, and the others stand up. A glance at many of the families will soon decide a very important property in some, and deficiency in others, — the breadth of the three principal petals. It will occur to the untaught child, that the flower which presents the largest portion of rich surface is the best. All who have grown the common iris know it has narrow, mean-looking petals: but the kind which has been propagated in England has a broad, rich-looking petal; and upon this feature does the beauty of the iris turn.

The three principal divisions, or petals, should be broad enough to touch each other, and form an arch or graceful curve, but described as one-third of a hollow ball or reversed cup, level at the lower edge by reason of the bluntness of the three petals at the outer end, which should form a circular outline on looking down upon them. The three smaller petals should stand up, and be perfectly clear of the three that fall down.

The three lower petals should be of a rich velvety texture, and be thick, smooth on the edges, firm in their places; and whether self-colored, striped, mottled, shaded, or spotted, the color should be well defined.

The three upper ones should be of a different color, and of a smooth or enamel kind of texture: the greater the

contrast of color, the better. The iris is a dwarf-plant ; and though three petals fall down and three stand up, and the fall of the broad petals is too sudden, and, on looking down on them, they hardly form any recognizable outline, it is capable of being produced with a fall not so sudden, and a curve perfectly graceful ; and the great advantage of this will be, that the entire surface may be seen at once, instead of a portion only.

The flowers should open but one at a time, that the beauty of the plant may be prolonged. The flower should be eighteen inches from the ground, and, when full grown and expanded, be four inches across.

THE MOREA.

This family was separated from Iris on account of the nature of the bulb, which much resembles a corm. The flowers are very brilliant, but fugitive. The family is not hardy ; but many of the species do well in pots. The soil should be a sandy loam, and the plants require frequent syringings to keep them free from red spider. They are mostly natives of the Cape of Good Hope ; and flower from April to July, according to the species. The bulbs do not

bury themselves like an iris, but produce the new bulb on the top of the old, like a crocus: so they may be planted deeper than iris.

M. sisyrinchium is a native of Spain, and might prove hardy: the flower is very handsome, deep blue, white, and yellow.

Loudon enumerates some twenty-five species, some of which are very handsome.

Some of the finest species are *M. sisyrinchium*, *M. Tenoreana*, white-and-blue flowers; *M. ciliata*, yellow flowers; *M. barbiger*, crimson and yellow; *M. lurida*, dark red; *M. edulis*, lilac; *M. angusta*, white and purple.

THE HERBERTIA.

This beautiful and rare bulb is a native of South America, near the Straits of Magellan. It should be grown in pots, in a compost of loam, peat, and sand. The flowers somewhat resemble an iris, and are blue, white, and pink. The chief species is *H. pulchella*. *H. pusilla* has striped flowers.

THE CYPELLA.

A very remarkably handsome bulb, of easy growth in the greenhouse. The flowers are yellow, with a dark stripe down each petal.

Our plants thrived well, planted in sandy loam, when imported in autumn; and bloomed freely in spring, each bulb giving many flowers. The species is *C. Herbertii*.

THE PHALOCALLIS,

Another species of *Cypella*, often appears in nurserymen's catalogues as *C. plumbea*, which should be *P. plumbea*. It is a beautiful plant, with evergreen leaves, and fugitive lead-color and yellow flowers, of which but one is produced from the bulb; the individual flowers, with every care, lasting hardly a day. We have bloomed this plant most successfully in a compost of loam and sand. It usually blooms in midsummer. The plant is a native of Mexico, and not very common.

THE VIEUSSEUXIA.

These plants were formerly classed as *Iris*, and are usually known as Peacock *Iris*.

They are all Cape bulbs, with slender, iridaceous foliage, and very brilliant flowers.

They should be potted in peat-loam and sand, about an inch deep, in autumn, and grown in an airy situation, with

frequent syringings to prevent the attacks of the red spider. The flowers will appear in spring and summer. After blooming, the bulbs should be gradually ripened, and then kept dry till the season for replanting arrives.

The most common species is *V. glaucopis*, having brilliant white-and-blue flowers. There are also species with yellow, red, and purple flowers; but they are by no means common.

The flowers of all the species are produced singly, and are very transient.



IX.

THE RANUNCULUS AND ANEMONE.



ALTHOUGH florists' flowers, of which the subjects of our present chapter are familiar examples, are seldom grown to perfection in this country, yet they must receive a passing word.

This neglect is especially noticeable in regard to both the ranunculus and anemone, as they can only be grown with frame protection in New England, and are not hardy enough to stand the winter unprotected.

We have many species of both of these plants, which are well known, and valuable ornaments of our gardens, woods, and fields: but the subject of the present volume confines us to the consideration of the tuberous *Ranunculus Asiaticus* and its varieties, and *Anemone coronaria* and *A. hortensis*;

these being the species from which the many varieties of garden ranunculus and anemone have been derived.

THE RANUNCULUS.

It has always been a question with florists as to what soil is best suited to this plant. While any good, light soil will bloom the ranunculus, care in the preparation of a suitable bed is rewarded by increased size and beauty of flower, both in form, color, and substance.

A compost which is sure to grow them well may be thus prepared: Cut from a good loamy pasture the surface sods, three inches thick: let these be piled one on another in ridges for a year, and then sliced down with a sharp spade to form a crumbly mass. Turn this over carefully, and pick out all wire-worms, grubs, and insects. Then pile it all into a heap again, and let it remain another year; by which time, all the grass and herbage will have resolved itself into vegetable mould. At the end of the second year, turn it over again, and again pick out any worms or grubs as before. In a soil of this nature which is now ready for use, the ranunculus will grow well.

The ranunculus likes a stiffer soil than the anemone, and is very impatient of drought.

Many florists use stimulating manures ; but their effect is bad on the tubers, causing rotting and disease, though often the size of the flower is increased.

In forming beds, it is frequently the practice to place a layer of well-rotted cow-dung about nine inches below the surface, which operates in the twofold service of retaining moisture and supplying nourishment.

The compost given above will, however, grow the tubers well, and give satisfactory bloom, without any manure. The bed should be dug out about a foot deep, and filled in with the compost, and the tubers be planted two inches deep in November, the earth being pressed close around them. On the approach of very frosty weather, the bed should be covered with a frame filled with oak-leaves, and this again with boards, to exclude the frost. Early in the spring, remove the frame, and the plants will soon appear. Keep them clear of weeds, and fork the earth loosely around them, watering them thoroughly if there should be a season of drought. As they come into bloom, and begin to color, shade them from the sun by an awning. When the flowers have faded, and the foliage turned yellow, take up the tubers, and keep them in a cool place until the return of the planting season.

The roots may be kept over the winter, and planted in the spring, as they are possessed of great vitality ; but they often become too dry, and more frequently mould.

No plant is more easily increased by seed, which may be sown in February in light soil, in boxes, in the greenhouse, where it will vegetate freely in about a month ; but none of the seedlings will be like the parent plant or like each other. The young tubers should be ripened off in July ; and, treated like old plants, will flower the next June.

The properties of a good ranunculus, as laid down by the best authorities, are, — the stem should be upright, eight to twelve inches high, and strong enough to support the flower. The form of the flower should be hemispherical, not less than two inches in diameter, consisting of numerous petals, gradually diminishing in size to the centre, lying over each other so as neither to be too close nor too much separated, but having more of a perpendicular than horizontal direction, in order to display the colors with better effect. The petals should be broad, with entire, well-rounded edges ; the colors dark, clear, rich, or brilliant, either of one color, or variously diversified on a ground of cinerous white, primrose-yellow, or flame-color, or diversified with elegant stripes, spots, or mottling.

The ranunculus may be forced by selecting tubers which have been kept several months over the season of planting, as these are more readily excited. Plant these in pots about the first of August; grow them in a cold frame with plenty of air, light, and water; and, by bringing them into the greenhouse at different times, a bloom may be kept up from October to February.

This plant will well repay careful culture, and does not merit the neglect with which it has been treated in this country.

As we have said, there are many hundred varieties: of these, the following are good:—

Aigle noir.—Black.

Commodore Napier.—Yellow.

Cramoisi à cœur vert.

Hortense.

Jaune panachée.

Noir pourpre.—Black.

Hercules.—White.

Merveilleuse.—Yellow.

Scarlet Roman.

A collection of a hundred varieties ordered from any Dutch florist would probably contain many very fine kinds.

THE ANEMONE.

The tubers should be planted late in October, in a bed prepared by removing the old soil to the depth of sixteen or eighteen inches. If the situation is cold and wet, drain it well, and do not go so deep; if dry and warm, the bed may be made deeper. Fill in four to six inches of cow-droppings, such as may be gathered in the pastures. Upon this, place as much good fresh earth as will raise the beds to their former level, or a little higher, to allow for settling. On the approach of very frosty weather, cover with a frame, and exclude the frost. In fine, the treatment is exactly that prescribed for the ranunculus.

Any common, moderately light soil suits the anemone: a wet, stiff soil rots the roots in winter.

If necessary to make a soil, take maiden-loam from the surface of a pasture, turf and all: to every load of this add one of cow-dung, and half a load of clean, sharp, fresh sand. Form this into a ridge, and let it remain a year; turning it, and picking out insects, every two months. A very good soil may be made of two parts garden-loam, one part well-rotted cow-dung, and one-half part sharp sand.

The anemone is somewhat more hardy than the ranun-

culus ; but the roots will not bear being long kept out of the ground.

They are easily forced, and may be had in bloom any month in the year by a series of plantings.

Both the ranunculus and anemone are propagated, to preserve varieties, by division ; to produce new varieties, by seed.

Every part of the crown, or root, which has a bud, will make a plant ; but it is not well to divide anemones too much, as they flower very weak if too small. The usual colors of anemones are red, white, and blue ; and the flowers are single, semi-double, and double.

The raising of seedlings may be done as prescribed for ranunculus, the seed being saved from the best single and semi-double flowers.

The properties of a good single anemone are, —

The stem strong, elastic, and erect, not less than nine inches high ; the flower at least two inches and a half in diameter, consisting of large, substantial, well-rounded petals, at first horizontally extended, and then turning a little upwards, so as to form a broad, shallow cup ; the color clear and distinct when variegated in the same flower, or brilliant and striking if it consists of but one color.

A double anemone should have the outer petals quite flat, the second series a little shorter, the third shorter still; and so on till the centre is quite full, when the whole should form a rather flat hemisphere. Every double flower should be of one full color.



Of anemones, there are about twenty species with tuberous roots, and some forty herbaceous species. Many of these are very fine: among which we may mention the pretty wood-anemone (*A. nemorosa*) and the double variety; *A. Appenina*, with blue flowers; *A. narcissiflora*; *A. Japon-*

ica, and the white variety; *A. pusatilla*, the well-known Pasque flower; and *A. vernalis*.

Of the varieties of *A. coronaria* and *hortensis*, the following are good:—

Shakspeare, blue.

Azur incomparable, blue.

Cramoisi royal, scarlet.

Feu superbe, scarlet.

Grandeur Merveille, rose and white.

High Admiral, scarlet.

Josephine, scarlet.

Ornement de la Nature, blue, fine.

L'Éclair, scarlet.

Queen of the Netherlands, white and rose.

Rose surpassante, bright rose.

Salvator, orange.

X.

THE OXALIS, IXIA, BABIANA, SPARAXIS, TRITONIA,
GEISSORHIZA.



WHILE many of the bulbs of which we have hitherto spoken are suitable for garden-culture, the subjects of our present chapter thrive only in the greenhouse. In England, however, they are planted in the open border, and survive in sheltered situations with little protection. But the flowers of all are very delicate, and liable to be injured by storms or changeable weather : therefore they are seen to much better advantage under glass, where, if well cared for, they make a splendid display. The culture of all the species mentioned in this chapter is the same. All bloom in early spring ; though many of the oxalis may be

had in flower at any season by forcing, and some few species naturally bloom in summer or early autumn.

In potting these bulbs, and starting them into growth, one of the primary rules of bulb-culture must be observed; that is, when the base of the bulb swells, or young roots begin to protrude, the bulb should be potted and watered. With a family so large as the oxalis, it is impossible to prescribe any general rule for potting; though most of the species cultivated in our greenhouses require only the ordinary treatment of Cape bulbs, and, with the other subjects of this chapter, — *ixias*, *babianas*, *tritonias*, and other Cape bulbs of like nature, — need only to be potted in October, in rich, light, sandy loam, in well-drained pots. After potting, the bulbs should have a gentle watering, and be kept in a cool, shady, airy place until they begin to grow: they should then be removed to a light, airy shelf, and be grown near the glass all winter, in full sunshine, to perfect a short, sturdy growth. Water should be freely supplied with the syringe to destroy red spider, with whom many of these plants are especial favorites. As soon as the flower-stem appears, a few waterings of weak liquid manure will be found beneficial.

When the blossoms begin to expand, the pots may be

removed to a less sunny and cooler situation, that the flowers may longer remain in perfection. Many species will need to have the flower-stems, and often the foliage, tied up to neat stakes, in order better to display the full beauty of the blossom. When the bloom is over, the foliage should be gradually ripened; and, when half the leaf has turned yellow, the pots should be turned on their sides, and the bulbs allowed to remain dry until the season for replanting. Mice are very fond of some of these bulbs, and care must be taken to put them to rest in a place not disturbed by their ravages.

THE OXALIS.

This family is very numerous; about one hundred species being enumerated. The mode of growth is very different, some being true bulbs, and thus coming immediately within the scope of our volume; while others have tuberous, or rather thickened, fleshy roots, and are thus only mentioned here on the score of relationship. Many have a true stem, and produce the tuft of leaves and flowers from the top; and this stem may be either above ground, or subterranean. Some species seem to combine the bulbous and tuberous nature, the subterranean stem producing little bulbs at the

extremities of rootlets. The bulbs are composed of fleshy scales, either loose or closely imbricate.

Most of the species produce their flowers with the foliage ; but a few bloom first, and then mature the leaves.

In some species, the new bulbs are produced at the end of long, straggling roots, the old bulb dying. Generally, on examination, a pot of oxalis will be found filled with straggling roots, producing bulbs at the ends, or sometimes profusely along the sides, of the rootlets.

Many have thick, fusiform roots, which break from the base of the bulbs, but which dry up and fall away when the season's growth is finished.

The foliage is generally petiolate, and much resembles clover, and has a sharp, sour taste ; whence the name of the species. The flowers are mostly yellow, red, pink, or white, and the various shades of these colors ; and are often fragrant. They open in the sun, closing in dull weather and at night.

Seed is not easily ripened ; and propagation is effected by the increase of bulbs, which takes place freely. We have some native species, one of which is an annual ; and the little oxalis which carpets our Northern woods (*O. acetocella*) is well known to every observant White-mountain tourist.

Many of the oxalis make admirable window-plants, as they flower freely, and are remarkably free from insects.

As all are of rather drooping, low habit, they are often effective as drooping plants ; and one of the smallest species (*O. versicolor*) is very effective for hanging baskets.

Of the many species, we can only mention the following :—

O. Boweii, or *Boweana*.—A species producing large, bright, rosy-red flowers during the whole autumn. The bulbs should be potted in the latter part of August, in rather large pots, six in a pot ; and will be in bloom by the first of October.

O. cernua.—This is a pretty plant, bearing yellow flowers in March, and requiring the general treatment of Cape bulbs.

O. flava.—This is a favorite window-plant. It should be potted in October, and will bloom from March to May. The foliage is neat and pretty ; and the yellow flowers, which are freely produced, are delightfully fragrant. There is a double variety, which does not bloom as freely as the species, and is not desirable except in collections.

O. versicolor.—This is a charming plant. The bulbs

are very small, and should be planted in fine, light soil, four or five in a pot, about half an inch deep, in October. The plants will form a mass of foliage, and droop over the pot, producing a profusion of little blossoms, tubular in bud, but, in full sunshine, expanding fully; the outside being crimson-red, and the inside creamy-white.

O. floribunda. — A species with short, fleshy stems, just serving to elevate the dense tufts of leaves and blossoms above the soil, and with herbaceous roots. The plant should be allowed to dry off during the winter, and be bedded out in summer, when it will bloom profusely for several months. The flowers are rosy-pink, and the plant is a native of Chili.

O. lasiandra and many of the other herbaceous species do well under the same treatment.

O. luxula and the variety *alba* are very pretty plants, with foliage covering the pot, and large red or white flowers, produced singly on stalks springing from the bulb. Pot in sandy loam in September, and the plants will bloom from November to February.

O. Deppii is a pretty pink, flowering species, the fleshy tap-roots of which are often used as an esculent.

The following species are worthy of cultivation :—

AUTUMN-BLOOMING.

O. monophylla, *Mauritiana*, *lobata*, *crenata*, *ambigua*, *Braziliensis*, *variabilis*, *tubiflora*, *sulphurea*, *purpurata*, *rostrata*, *tricolor*, *dentata*, *fallax*, *furcata*, *caprina*.

WINTER AND SPRING BLOOMING.

O. miniata, *compressa*, *bipunctata*, *multiflora*, *cuprea*, *incarnata*, *luteola*, *polyphylla*, *punctata*, *disticha*.

SUMMER-BLOOMING.

O. macrophylla, *caprina*, *cuneata*, *elongata*, *pentaphylla*, *flabellifolia*.

THE IXIA.

These bulbs are all natives of the Cape of Good Hope. The family formerly included many other bulbs which have been separated from it. At present, the genus consists of about thirty species, which are distinguished from *Sparaxis* by not having a jagged sheath, "from *Babiana* by having a dry seed-pod instead of a berry, and from *Tritonia* by having the stamens inserted at the bottom of the petals instead of in the tube of the flower." The bulbs are small, and look so much alike, that care must be taken to distin-

guish the species by proper labelling. They require only to be planted in sandy loam, from four to eight bulbs, according to the size, in an eight-inch pot, and to have the general treatment of Cape bulbs. They bloom in March, and, if well grown, make a splendid show. The different species are propagated by the natural increase of the bulbs. Seedlings are easily raised.

I. viridiflora. — This is one of the most charming plants we know. The color of the flowers — a peculiarly delicate and yet vivid, indescribable green, with a dark, black eye — produces an effect to which no words of ours can do justice.

It is a strong-growing species, and blooms freely, but often fails to perfect bulbs as large as those planted. It can readily be imported, and is very cheap.

I. erecta. — A fine species, with a long spike of white flowers, with a dark eye. It produces plenty of offsets, and, with the variety *incarnata*, should be in every collection.

I. monadelphæ. — A pretty, free-blooming species, having a peculiar, flattened bulb. The flowers are blue, with green eye, and variously banded.

I. conica. — A lovely and very showy species, with orange flowers and crimson buds. As the flowers are very freely

produced, and very handsome, this species should be generally cultivated.

I. maculata. — A very beautiful species, with flowers of white and brown, and much resembling *I. viridiflora* in habit. A variety *ochroleuca*, sometimes considered a species, has large, creamy-white flowers, with a brown centre, and long, slender tubes.

These species are rather difficult to keep.

I. scillaris. — A small species, with flowers varying from purple to white. It flowers very early, and should therefore be potted in September. It is more tender than the species previously described.

I. patens. — A species with bright-crimson flowers, and of easy culture in loam and sand. In England, the species is hardy enough to stand the winter, and probably would be hardy in the Southern States. A bed of such a plant would produce a most brilliant effect.

We may also mention *I. capitata*, white, with blue centre ; *I. crateroides*, reddish yellow ; *I. hybrida*, white ; *I. aristata*, pink ; *I. odorata*, yellow ; *I. crispa*, bright pink.

In fact, all the species are worth growing, and make good window-plants. It is, however, better to grow the plants in a pit or greenhouse, and, when in bloom, bring them into

the parlor, as the foliage is not handsome, and the only beauty of the plants consists in the brilliant blossoms.

These remarks apply with equal force to *Babianas*, *Tritonias*, and *Sparaxis*. Many fine seedling varieties of *ixia* have been recently raised, which are even more beautiful than the species. A small outlay will import a fine collection of these showy plants, and would give great satisfaction to any amateur. It is strange that Cape bulbs are so little grown.

THE BABIANA.

The roots of these plants are solid corms, covered with hard, brown scales. A new corm forms every year from the centre of the old one, which forms a hard, dry shell beneath it. These bulbs have very showy flowers, in form somewhat between an *ixia* and a *gladiolus*.

They are not as hardy as *ixias*, and are very impatient of wet, especially during the season of rest. A light, sandy soil suits them well; and, as the leaves are generally hairy and plaited, they are even more subject to attacks of red spider than the *ixias*. In general, however, they require much the same treatment, and a season of perfect rest, during which they must be kept very dry. They are propagated

by offsets and seeds, the latter of which bloom the third season after planting. As window-plants they do well, but do not flower as strongly as in the greenhouse.

There are about twenty species, all natives of the Cape ; among which we may enumerate

B. rubro cyanea. — This plant is often sold by florists as an ixia, but is easily distinguished by its broad, plaited leaves. The flowers are among the most brilliant of the bulbous tribe, and present a combination of brilliant ultramarine blue and dazzling crimson. The bulbs are small ; but each produces three or four flowers, which remain in perfection several days if kept in the shade. The plant is of easiest culture, requiring only the usual treatment of Cape bulbs.

B. villosa. — This is a showy species, with bright-crimson flowers, freely produced in April. A large pot of this species is very effective in the greenhouse.

B. stricta. — A pretty species, with lilac-and-white flowers.

B. tubiflora. — A free-growing plant, with light or straw-colored flowers, — often reddish. This species has done better with us in the greenhouse than any except *B. plicata*.

B. sulphurea. — A fine species, with very large-spreading, sulphur, cream-colored flowers.

B. plicata. — A dwarf-growing species, producing an abundance of blue, fragrant flowers.

We may also mention *B. spathacea*, purple flowers ; *B. bicolor*, blue and white ; *B. angustifolia*, blue, with chocolate centre ; *B. sambucina*, rich purple, fragrant flowers. Indeed, all the babianas are well worth growing ; and one can hardly make a mistake in planting them.

THE SPARAXIS.

These plants, in their flowers, bear a great resemblance to *ixias* ; and, indeed, only differ from them slightly botanically. The flowers are usually more showy ; but the plants thrive and bloom well under the same culture. The treatment after blooming, and the modes of propagation, are essentially the same.

There are about a dozen species, all natives of the Cape of Good Hope.

S. tricolor. — A very brilliant flower, of bands of yellow, black, and orange. It should be potted in October, in a compost of two parts sand and one part each of yellow loam and leaf-mould, and be regularly but moderately watered during the winter. When the flower-buds form in spring,

the supply of water should be increased until the flowering season is over, when the bulbs should be gradually allowed to go to rest. There are varieties with red, white, and purple flowers.

S. versicolor. — A species somewhat resembling the last ; the ground-color of the flowers, however, being crimson instead of orange. It is also hardier, as in England it stands the winter in the garden.

S. grandiflora. — This species has from one to five flowers, purple inside, and whitish outside. There are two varieties, — *liliago*, by some considered a species ; and *striata*, the former with white and the latter with variegated flowers.

All flower in spring, and require the same treatment as the other species.

S. pendula. — This elegant species produces long, drooping spikes of purple flowers. In growth and habit, it is unlike all the other species. The spike is often four or five feet long, springing from a tuft of long, reedy leaves. The plant is a native of wet situations, and does best planted out in the greenhouse, and allowed to take care of itself. We have, however, grown it successfully in a pot, using a compost of turfy loam and sand.

Some of the other species are *S. anemoneflora*, white flowers; *S. lineata*, white and pink; *S. bulbifera*, yellow; *S. stellaris*, purple; *S. fragrans*, yellow.

Many of the sparaxis have the curious property of producing small bulbs in the axils of the leaves and on the joints of the stem: these bulblets, when ripe, may be planted, and in time produce flowering plants.

THE TRITONIA.

The members of this family differ strangely in appearance; some much resembling an ixia, others again being like a babiana, some nearly approaching a gladiolus, while others resemble none of these.

The plants are generally of dwarf growth, and rather more tender than their near allies the ixia and gladiolus. In growth, they are benefited by the usual treatment given to Cape bulbs of weak growth; that is, the application of bottom heat to encourage the growth of roots before the tops become largely developed.

A good plan is to plunge the pots in a weak hot-bed as soon as the bulbs are planted; the secret being, to allow the temperature of the roots to be a few degrees higher than that of the foliage.

We extract from an English work a method of growing these Cape bulbs which has been very successful, and which might be practised in this country, certainly south of Philadelphia, without difficulty : —

“Pot the bulbs in October, in light, turfy loam and sand, with good drainage. Prepare a bed of dry old tan, mixed with fresh hot litter from the stable, at least one foot deep below the level of the garden ; and place a large frame over it. In this plunge the pots : the more tender gladioli at the back, as being the stronger growers ; and ixias, sparaxis, babianas, tritonias, in regular gradation to the front. Give air when the weather will admit ; being careful not to water so much as to induce damping off, and always by banking and covering with mats and shutters to exclude frost. The sparaxis, under this treatment, begin to show bloom about April, and will be succeeded by ixias, babianas, gladiolus, and tritonias, in succession. The plants should be all removed to the greenhouse to bloom. After the blooms have passed, replace them in the frame, continue watering to perfect the foliage, and form bulbs for the ensuing season. Give full exposure to the sun until the leaves have died away, that the bulbs may become thoroughly ripened.”

There are about twenty-five species of tritonia, of which those most commonly grown are

T. crocata. — This species is commonly known in green-houses as orange ixia, and is one of the most floriferous of Cape bulbs. It requires only to be potted, syringed for red spider, and regularly watered; and, in April, is sure to give a profusion of its rich orange-flowers.

It propagates rapidly by offsets and by seed, which comes true.

T. crispa. — The flowers are pale bluish color, and resemble a babiana. The plant does not flower until very late in the spring.

T. rosea. — A handsome but delicate species with rosy flowers, having a deep pink tube.

T. longiflora. — The flowers are dirty white, and, as the name indicates, have very long tubes: there are varieties with straw-color and yellow flowers. The species grows and flowers freely, and is, with the varieties, one of the most satisfactory of the family for greenhouse culture.

T. fucata. — A very showy plant with yellow and red flowers of a peculiar form. The species multiplies freely, but is difficult to flower.

T. lineata. — A pretty species with pale-yellow and orange flowers, finely pencilled with dark lines.

T. squalida. — A lovely species, not uncommon in collections, producing white-and-pink beautifully marked flowers. Other species are *T. fenestrata*, orange-flowers; *T. flava*, yellow; *T. miniata*, orange; *T. pallida*, straw-color; *T. purpurea*, purple; *T. Rochensis*, cream-color; *T. securigera*, brown; *T. deusta*, reddish; *T. viridis*, green; *T. aurea*, orange; *T. Capensis*, white. *T. aurea* is now separated from this family, and called *Crocasmia aurea*.



THE GEISSORHIZA.

A small family of tender bulbs, formerly classed with ixia, mostly natives of the Cape of Good Hope, and re-

quiring the usual treatment of Cape bulbs, except that the soil in which they are grown should be very sandy. The plants are commonly called "tile-root," from the tile-like scales which cover the roots. None of the species are very common. The best are

G. Rocheana. — A pretty little plant known as "plaid ixia." The bulb is small, but the flowers very brilliant; the colors being blue, white, and crimson.

G. obtusata. — A larger-growing species with straw and buff flowers.

G. vaginata — A very showy species, flowering in August. The flowers are yellow, tipped with dark purple or black.

G. secunda. — A blue, flowered species, with a white variety.

G. excisa. — A small-growing species known as *Ixia excisa*. The flowers are white, lined with pink and with a green centre, and open only in full sunshine.

There are about half a dozen other species which have been introduced; but they are rarely met with, and some are probably lost to cultivation.



DESCRPTION must fail to convey an idea of the stately grandeur, the queenly purity, and graceful habit, of this beautiful flower.

The lily is pre-eminently a garden-bulb ; there being very few, which, with some slight protection, will not bear a New-England winter, and many are among the hardiest garden-flowers.

All lilies have scaly bulbs, and are propagated by offsets, by seed, by stem-bulbs in some cases, and by separating the scales of the bulb and planting each scale in silver-sand, where it will soon make a small bulb. All the above methods, except by seed, are for the perpetuating old estab-

lished species or varieties : by seed alone, new hybrid varieties are produced. The culture of the lily is very simple. Most of the species like a deep, rich soil, enriched with well-rotted manure ; but care must be taken that water does not stand round the roots in winter, as this often rots the bulbs. Many of the species like a sandy loam, and most are benefited when first planted by placing in the hole a handful of sand.

The generally received opinion is that lilies should only be transplanted in the autumn. In our experience, however, they have done quite as well removed in early spring ; care being taken to keep the bulb from drying, and not to injure the young roots or shoots. In transplanting, the bulb should be kept out of the ground the shortest possible time. It is the drying process the bulbs have undergone which causes such loss in imported lilies ; more than one-half of them, in spite of every care, failing to come up the spring after planting.

Lilies once planted should be disturbed as seldom as possible, and only when rendered necessary by the increase of bulbs : for most species, unless propagation is the object, once in five years is often enough for the health of the plant. As the bulbs cannot be disturbed after planting, the preparation of the bed becomes a matter of the first importance. The soil should be deep, that the plants may not suffer from

drought ; and be enriched with a liberal quantity of well-rotted manure, which should be well worked in. Each autumn, a top-dressing of well-rotted manure should be carefully forked in between the rows ; and, on the approach of winter, the bed should be covered with clean litter or leaves, which covering should be removed in early spring. The bulbs should be planted from three to six inches deep, according to their size.

Many of the lilies force well in the greenhouse, particularly *L. candidum*, *speciosum*, *longiflorum*, *lancifolium*, and *Japonicum* ; but none are suitable for parlor culture. There are about seventy-five well-known species and varieties ; and new species are being discovered, and new hybrids produced, every year.*

The characteristics of a good lily are as follow : —

LILY.

1. The plant should be only as high from the pot to the bottom flower as it is from the bottom flower to the top one. The leaves should be long, and plenty of them at bottom, and gradually shorten and lessen in number as they approach the bottom bloom.

2. The individual bloom should be large, and composed

of broad petals reflexing in the form of a globe, without separation at the points, or forming gutters or uneven ribs in the petals, but showing a fair, round, even surface, and exhibiting none of the backs of the petals.

3. The petals should be thick, rich in texture, free from notches, or puckers, of pure ground-color or white. The blooms should be on strong foot-stalks, the lower flower farther off the stem than the upper; and there should not be less than seven in the truss, or spike, that should form a tapering head of flowers.

4. The varieties speckled with the ruby-like spots should be of pure white ground, and the spots bright scarlet: those with pale rosy ground should have black spots; and the more and the larger, the better.

The species most commonly cultivated are

L. candidum.—This is the old-fashioned white or Annunciation lily, one of the oldest inhabitants of the garden, but always a favorite, and a plant of which no garden can have too many. While thriving in common border-soil, this species grows and flowers with wonderful luxuriance in a richly prepared bed. In our own garden, such a bed was a splendid object during the past season. The bed was ten feet in diameter, excavated six feet deep in sandy

soil, filled with rich loam and manure, and planted with fifty bulbs of this lily; and the effect, when in bloom, was very fine. The species is a native of the Levant; and there are varieties with double flowers, with striped and spotted flowers, and with foliage variegated with gold and silver markings. All are of value in a collection; but none are to be compared with the species.

L. bulbiferum. — This is the common orange-lily, hardy in any situation, propagated freely by bulblets. It need not be removed when once planted; for it will take care of itself, and flower freely year after year.

L. monadelphum. — The common yellow Caucasian lily is not as common as *L. bulbiferum*, but is equally hardy, and requires the same treatment. In growth, it resembles the martagon lilies, and has been an inhabitant of our gardens since 1800.

L. peregrinum. — This very handsome species is a native of the Levant. It is perfectly hardy, and its white flowers are very showy; but it is not common.

L. croceum. — A very hardy species, with showy yellow flowers, a native of the south of Europe, growing freely in common garden-soil.

L. Canadense. — This, the species so common in rich

meadows, producing drooping yellow flowers, is greatly improved by cultivation ; the plant increasing in size and in the number of flowers. The bulbs should be transplanted in autumn to a bed of peaty loam, where they may remain undisturbed for years.

L. superbum. — This lily is not found wild in Southern New England ; but, in New York and the Northern States, is the common red drooping-lily of the meadows. In cultivation, it is a magnificent plant ; often producing a spike with from twenty to thirty flowers. It requires the same treatment as the last species ; and, like it, has white creeping roots.

L. Philadelphicum. — The common upright red lily of the pastures, producing one, rarely two or three, handsome red flowers, spotted with black. The bulb is small and white, and may be transplanted to the garden, where it grows vigorously. The soil should be rather light.

L. Catesbaei. — The Southern red lily much resembles the last ; but the color is lighter. It is plentiful south of Philadelphia ; and has even been found wild in Massachusetts, where it proves hardy in the garden.

L. martagon. — Of the Turk's-cap lily there are a dozen varieties, with white, reddish, and purple flowers and

whorled leaves. They are all of coarse habit, but look well in the garden. The individual flowers are small; but many are produced on the spike. Most of the species are hardy; though, in New England, those with white flowers require winter protection of leaves or litter, as they are sometimes killed.

L. Pyrenaicum. — A fine species much resembling the martagon, but with yellow flowers, and leaves not whorled. A native of the Pyrenees, and hardy.

L. Chalcedonicum. — A beautiful flower, commonly called the scarlet martagon, generally hardy, and only requiring to be planted in good soil. A native of Hungary.

L. longiflorum. — This splendid lily is hardy enough to stand a New-England winter. The flowers are white, six to nine inches long, and very fragrant. The bulbs should be planted four inches deep in a well-prepared bed, which should be covered during the winter with six inches of tan or clean litter.

L. pumilum. — A lovely little species with red flowers; a native of Siberia; hardy, but not common.

L. tenuifolium. — A pretty species with drooping red flowers and fine-cut foliage; a native of the Caucasus; hardy, but rare.

L. atrosanguineum. — A species with orange-red flowers, from Japan ; perfectly hardy in a light soil.

L. Kamschatkense. — A small-growing species with purple flowers, hardy.

L. pomponium. — A well-known red lily, a native of Siberia, and long an inhabitant of the garden. Both the species and a double variety are worthy a place in the border.

L. speciosum and *lancifolium*. — These and the many hybrid varieties are the well-known Japan lilies of the garden, once considered greenhouse species, but now known to be perfectly hardy. The flowers are too well known to need description ; and, indeed, no words can do justice to their beauty. The hybrid varieties of the last five years far exceed the species in beauty, and are now so cheap as to be obtained by all. These plants delight in a rich deep soil ; and, when well grown, are splendid objects in the garden.

L. Japonicum. — This beautiful species is hardly hardy in New England. The flower is large and bell-shaped, the petals curving upward at the point. In the greenhouse, it blooms well.

L. auratum. — This, the most magnificent lily known to

cultivation, is not as hardy as *L. lancifolium*, and more liable to disease. Bulbs left out in the open ground during the winter will come up and do well at first; but, after the flower-buds are formed, they are very apt to die out, the leaves turning yellow, and the whole plant rapidly failing. This is not uncommon, even when they are kept in pots and sheltered from severe frosts. The plant requires the house treatment of *L. lancifolium*, but may be bedded out in the border in summer. The flower is very large, white, with deep yellow bands down the petals. There seem to be varieties, differing in the intensity of the bands: the stalks are many-flowered. The accounts of its size, beauty, and fragrance, are not exaggerated. The credit of introducing this splendid lily belongs to New England. It was brought from Japan in 1860 by F. Gordon Dexter, Esq., who placed it in the hands of Francis Lee, Esq., by whom it was bloomed in the summer of 1861. In the spring of 1862, Mr. Lee transferred it to Francis Parkman, Esq., a zealous amateur, who exhibited it at the Massachusetts Horticultural Exhibition on the 8th of July of the same year, and described it in "The Gardener's Monthly." It was bloomed in England this same year (1862) for the first time.

L. venustum. — This beautiful species is often imported under the names of *L. testaceum*, *superbum*, and *peregrinum*; and sending for any of these to Holland will bring a good supply of *L. venustum*; and, indeed, one can scarcely have too many. The plant is hardy, grows well in any garden-soil, and produces large spikes of nodding buff or creamy orange flowers. It likes a rich soil not too wet.



The greenhouse species are of easy culture in loam and leaf-mould with a little sharp sand. They require large pots; plenty of water, light, and air, while in growth; and

are benefited by waterings of weak manure-water. Among the tender species may be mentioned *L. giganteum*, a very fine species from the Himalayas, with large white flowers; *L. roseum*, with rosy-purple flowers, from India; *L. Thompsonianum*, an Indian species, with rosy flowers; *L. Wallichianum*, from Nepaul, with greenish-white flowers; and *L. concolor*, a native of China, with brilliant red flowers.

There are many other lilies in cultivation, and many hybrids, to which it would be difficult to assign their true position. Later years have shown many to be hardy which were once reputed tender, and the future may show further progress in the same direction.

The different species and varieties hybridize freely; and there is no flower which presents greater attractions for the skill of the botanist or the experiments of the amateur.

XII.

THE FRITTELARIA, FERRARIA, ALLIUM, ORNITHOGALUM.

THE FRITTELARIA.



EARLY in the spring, the dark blunt shoots of the crown imperial (*F. imperialis*), pushing from the ground, give promise of the crown of showy blossoms which a few weeks will develop. And, indeed, in few flowers is the growth more rapid. Each sunny day the plant grows apace, and soon unfolds its crown of flowers, surmounted by the tuft of green foliage. The crown imperial, which was the most ornamenta of the frittelarias, has been separated from the genus, and now forms a new family called *Petilium*, the species being *P. imperiale*; but, as it is popularly classed with

frittelaria, we have thought best to describe it under that family.

All the frittelarias do best in a deep, rich soil, and are much benefited by top-dressings of well-rotted manure. All the crown imperials are hardy, requiring no protection in winter: in summer they do not like a soil which becomes very dry, as the bulbs suffer from drought. Many of the smaller species of frittelaria, especially those with white flowers, are less hardy, and in New England require winter protection. Like the crown imperial, they are impatient of drought; and none should be long kept out of the ground when transplanted. All the species propagate freely by offsets, and most ripen seed freely, which should be sown and treated like other seedling bulbs. Seedlings bloom the third year.

All the species may remain in the ground undisturbed for years, where they soon form large masses, and are very effective.

All bloom in May, and contrast well with tulips and the later hyacinths.

F. (Petilium) imperialis.—This species is a native of Persia, but has been an inmate of the garden since 1596. The bulbs are large, and have a rank, un-

pleasant smell, which, when the plants are in rapid growth, is distributed over the whole plant, so that the breeze blowing over a bed of crown imperials is by no means pleasantly perfumed. The flowers, however, are fragrant: they are remarkable for the drops of honey which stand in the petals of the flower, and which shine with peculiar lustre. This property is possessed in common by all the family, but in the greatest degree by this species.

The ovaries, after the fading of the flower, become erect, and produce abundance of seed.

This species should be planted six inches deep, in a very rich soil. The stems appear early in spring, but die away by the last of June; and their place may be occupied by bedding-plants. These plants look well in a large bed composed of mixed varieties, of which those with golden and silver striped foliage are the finest-foliaged plants of early spring.

There are many varieties, of which the single red, yellow, and those with variegated foliage, are the best. The double varieties are by no means as good as the single.

F. Persica.—This very handsome plant is as hardy as the crown imperial, and requires the same culture.

When well grown, it is very showy; for, although the individual flowers are small and dull-colored, they are produced on a long spike in great profusion.

F. meleagris.—This is the well-known guinea-hen flower, and is a native of England. The bulb is small, white, and flat, and produces one large nodding flower. The species is perfectly hardy, and requires only the same care as a crocus, except that it does not need frequent replanting. There are other species, of which we may mention *F. latifolia* and *tenella*, which resemble *F. meleagris*, *F. lutea* with yellow, and *F. obliqua* with dark-purple flowers.

THE FERRARIA.

These are Cape bulbs, and are worthy of culture by the amateur, though the flowers are dull-colored. They require to be potted in October, in sandy loam, with a little peat, moderately watered during growth, and kept perfectly dry when at rest. They flower in early spring, and then immediately lose their foliage.

The plants are all dwarf, and the bulbs small: in growth, they need a light, airy situation.

They increase freely by offsets, and also ripen seed, which may be sown when ripe, or kept until the following spring. In England they survive the winter, planted in a warm, dry border.

The species are,—

F. antherosa, with green and brown flowers.

F. angustifolia, with brown flowers.

F. uncinata.—A curious species, with green flowers, having a bright-blue mark in the centre.

F. atrata.—Very brilliant purple flowers.

F. divaricata.—Flowers purple and green.

F. elongata.—Dark-purple flowers; a native of Montevideo, flowering in July.

F. obtusifolia.—This is the largest species, growing eighteen inches high, and throwing out branches. It blooms in summer, and should be treated like summer-blooming bulbs. It is showy, and produces a profusion of brown flowers.

F. undulata.—A pretty species, with green and brown flowers.

THE ALLIUM.

Although not suitable flowers for bouquets or for parlor culture, many of the onions (*allium*) are very

ornamental in the border. Indeed, the family, probably from prejudice, has been much neglected, when many far less showy plants have found favor.

Many of the species are very ornamental, and are perfectly hardy in common garden-soil, requiring no particular care, and yearly producing masses of showy flowers.

Out of some fifty species, we can recommend the following for the garden. All increase readily by offsets.

A. moly.—A low-growing species, which in early June produces a mass of golden-yellow flowers. A native of the south of Europe, and one of the hardiest species.

A. cœruleum.—A pretty species, with bright-blue flowers; a native of Russia, and hardy.

A. senescens.—Flowers purple.

A. azureum.—Blue flowers.

A. angulosum.—Light purple or pink flowers.

A. longiflorum.—Very dark purple.

A. Neapolitanum.—A fine species, with a large umbel of white flowers. Rather tender, and requiring greenhouse treatment. There are many tender species, with showy flowers, which may be easily grown where room can be given them.

THE ORNITHOGALUM.

A family of very pretty bulbs, containing about a dozen hardy and some fifty tender species, all familiarly known as "star of Bethlehem." The prevailing color of the flowers is white; but many are marked with green, and some are yellow. The hardy species require the same treatment as a tulip, but may be left in the border for years undisturbed. They will then flower regularly every year, and increase largely by offsets.

The tender species require the usual treatment of Cape bulbs; and, in the greenhouse, flower from May to July. These plants are natives of Europe, Africa, and America; but a large proportion come from the Cape of Good Hope. Among hardy species we may mention

O. umbellatum.—This pretty species is very common in gardens. The flowers are silvery-white, green outside, and open only in sunshine. They are produced in great abundance, and have a very pleasing effect. The species multiplies rapidly by offsets, and, having escaped from gardens, seems disposed to become naturalized.

O. fimbriatum.—A species with bluish-white flowers, blooming in early spring. A native of the Crimea.

O. Narbonense.—A small-flowered and not very handsome species, the blossoms being small and straggling: only desirable in a collection.

O. Pyrenaicum.—A green-flowered species of little beauty.

O. nutans.—A pretty species, with drooping, white flowers; hardy if protected by leaves during the winter.

O. pyramidale.—A fine species, with a spike of white flowers in June. The foliage is handsome, and appears very early in spring, followed by the flower in June.

O. bulbiferum, *comosum*, *montanum*, and *marginatum*, often prove hardy. Many of the tender species are very beautiful, and should always find place in a collection of Cape bulbs.

O. niveum has small snow-white flowers and grassy leaves.

O. revolutum.—An elegant species, with rich foliage and showy flowers, which are white, with a rich yellow centre, in a conical raceme.

O. corymbosum.—A native of South America, with large, white, fragrant flowers.

O. conicum.—Flowers pure white, very large; native of the Cape of Good Hope.

O. lacteum.—A fine species, producing an abundance of rich white flowers.

O. Arabicum. — This handsome plant is not uncommon in collections. The flowers are large, whitish, with a dark centre. It requires a very sandy soil.

O. aureum. — A beautiful species, with yellow flowers, but of somewhat difficult culture; not growing freely or flowering well. It requires sandy loam, but often remains dormant two years before sending up its foliage.

O. thyrsoides. — A fine plant, with yellow flowers, somewhat resembling the last, but of very much easier growth. The plant is a native of the Cape, and only requires planting in sandy loam, and the usual culture of Cape bulbs. A fine variety, *flavescens*, is of deeper color; also a native of the Cape, but introduced fifty years later than the species.

Many of the ornithogalums have insignificant flowers, and are not worthy the room they would occupy in the greenhouse.

Most of the species have the property of continuing to expand their flowers when the spike is cut, and placed in water, sometimes for several weeks, which renders them valuable for parlor decoration. This is particularly the case with *O. pyramidale*, *O. caudatum*, and *O. sulphureum*.



FROM the latter part of July, and during the month of August, up to the time of the early frosts, the bed of gladiolus is the most showy portion of the flower-garden.

But all these which we commonly grow are the offspring of two or three species, and are mostly hybrids; being varieties, and not species. There are, however, about fifty distinct species, many of them among the most beautiful of Cape bulbs, and requiring the culture usually given to that class. They are, however, very rarely in cultivation, though the reason would be difficult to find; for a more showy family, or one of easier culture, cannot be found among bulbous plants.

There are, however, two gladiolus, natives of Europe and Asia, which are hardy, and only require to be planted in common soil in the bulb-border about two inches deep, where they will flower, if undisturbed, for years, and rapidly increase by offsets.

G. communis.—A native of the south of Europe, and very common in gardens. The flowers are dull reddish-purple, produced on one side of a short stalk. The plant is perfectly hardy, and increases rapidly by offsets. There are varieties with white and flesh-colored flowers, which are desirable. While a clump of this species is very pretty, the flowers are too small and dull-colored to make it very effective in the garden. Its great recommendation is its hardiness.

G. Byzantium.—This species, as its name implies, is a native of the region near Constantinople. The flowers much resemble those of *G. communis*, but are larger, are produced on both sides of the stalk, and have yellow stripes down the lower petals. The species is hardy, and requires only common garden-culture, but does not increase readily. Both this and *G. communis* need a sunny situation to bloom well.

Of other fine species, many of which are hardy in England, but with us are grown in the greenhouse, bloom-

ing in June and July, we may enumerate a few; only premising, that, in pot-culture, the gladiolus requires a rather large pot, with light, rich soil, good drainage, and plenty of water when in growth, with frequent syringings and spongings to keep off the red spider, which particularly infests this plant. The bulbs should be planted at least three inches deep, if of large size, as the new bulb is formed on top of the old one; and the plants should have a light, airy position, to prevent them from becoming drawn.

G. cardinalis. — A common but very handsome species, with scarlet flowers, marked with a white spot on each petal. From this species many fine varieties have been raised, as it hybridizes freely with many of the tender kinds. Both species and varieties are very desirable.

G. cochleatus. — A curious species, with stiff leaves, and white flowers stained with red, and having a peculiarly spoon-shaped lip; whence the name. A native of the Cape, flowering in March, but not common.

G. versicolor. — A showy plant, the colors of which are said to change at sunset. It is a native of the Cape, and rather rare in collections.

G. suavolens. — A pretty species, of dwarf growth, with pale-yellow, fragrant flowers.

G. recurvus.—A very ornamental species, with violet flowers tinged with yellow, and very fragrant. The stem produces two to five flowers, “which, when they first expand, are yellow, so dotted over with very small violet-blue spots, that they look quite blue at a distance. In this state, the flowers are very beautiful. In the course of two or three days, however, the dots disappear, and the whole flower becomes a pale and somewhat dull violet-blue.”

It is a native of the Cape, and was first grown in England in 1760, being raised from seed.

G. carneus.—A fine species, with blush flowers, marked with crimson and white.

G. blandus.—A species resembling the last, but with white flowers slightly stained with red.

Many fine hybrids have been produced between this species and *G. cardinalis*.

G. albidus.—A fine species, with flowers nearly pure white.

G. ramosus.—There is some question whether this plant is a hybrid or a true species. The plant is tall and of sturdy growth, producing a branching spike of rosy-red flowers, the inferior petals marked with darker shades. It

sometimes does well planted out in the spring, but is inferior in beauty to the fine hybrids of *G. Gandavensis*.

G. concolor. — A pretty species, with yellow flowers, which are fragrant towards evening. The flowers vary in number from two to eight, and are produced on the same side of the spike.

G. viperatus. — A singular plant, with greenish-gray flowers, with brown and dark stripes. The species is very desirable from the peculiar color and the fragrance of the flowers.

G. Colvelli. — A fine hybrid, produced in 1823 by crossing *G. concolor* with *G. cardinalis*, and still maintaining its place in collections. The flowers are scarlet, marked with purple, produced on a close spike, and are fragrant. It requires the same treatment as its parents.

We may also mention as desirable *G. alatus*, *Algoensis*, and *Namaquensis* (sometimes considered varieties of *alatus*), *brevifolius*, *trichonemifolius*, *tristis*, *Watsonius*, *recurvus*, *Millerii*, *gracilis*, *edulis*, and *cuspidatus*.

All these could probably be grown in this country under the frame-culture mentioned in Chapter X., and would well repay the care required. Most of them are moderately hardy, and in the greenhouse should have a cool, airy

situation. We are inclined to believe that careless culture, rather than any difficulty of a more serious kind, is the reason we so seldom see any of this beautiful class in collections.

We now come to the more hardy species, for which we can give no better cultural directions than are laid down in an article written by us a year ago for "The Horticulturist."

Our garden gladiolus are mostly hybrids from *G. Natalensis* and *G. floribundus*, or *oppositiflorus*, with a little of the blood of *G. cardinalis* and *ramosus* in some of the fine varieties. They are commonly known, in gardeners' parlance, as "Gaudavensis hybrids," from the first hybrid raised, and differ much in habit and form from any of the species we have before described.

The name Gladiolus, from the Latin, is a true diminutive from *gladius*, "a sword," and therefore means a little sword: its reference is to the shape of the leaves of the plant; and the same is found in the common name, "sword lily." The name is generally incorrectly pronounced gladiólus, with the accent on the o. Following the analogy of the Latin, the word should be gladiólus, the accent on the i, leaving the penult short; a far more euphonious word.

Gladiolus floribundus, or *oppositiflorus*, is a native of the Cape of Good Hope, and was introduced to English gardens about the year 1788. It is a well-known species, of easiest culture, and will, even in New England, sometimes survive the winter in the open ground. The best mode is to take up the bulbs, which are small, soon after the frost has killed the leaves, and preserve them in a cool, dry cellar, free from frost, until spring. The flowers are produced abundantly on opposite sides of the stem (whence the names), and are of a whitish pink, with purple or lake markings.

Gladiolus Natalensis, or *psittacinus*, was introduced in 1829. It is a plant of sturdy habit, flowers scarlet and yellow, mottled; too well known to need particular description. Although a native of the hot region of Port Natal, it is often found hardy; and in England, and some sections of our country, is perfectly so; the bulb requiring only to be surrounded by sand to prevent its rotting in the winter.

While *G. floribundus* is still commonly cultivated, *G. Natalensis*, having been long since surpassed in habit and color by hundreds of hybrids, is entirely neglected, and is rarely met with; and few indeed would imagine that the introduction of this now-despised species threw the whole

horticultural world into a fever of excitement, and that the bulbs commanded immense prices.

These being the original species, the first hybrid was *G. Gandavensis*, so called from the town of Ghent. Its origin is obscure; the late Hon. and Rev. William Herbert, the best authority on bulbs, declaring it impossible it should be a hybrid between the two species mentioned above, as, with all his skill in hybridizing, he had never been able to cross those two species.

Be this as it may, certain it is that to *G. Gandavensis* we owe all our fine hybrids; this variety crossing freely with all other varieties and some of the species, the seedlings sporting very much.

The color of the flowers of the variety is scarlet-red, with deep or light yellow blotches on inferior petals. It is a showy plant, and, although excelled by hundreds of seedlings, is worthy of cultivation.

GENERAL TREATMENT.

The bulbs should be planted as soon as the ground is fairly dried in the spring and all danger of frost is over. If deeply planted, a surface-frost does no injury. Plantings may be made every two weeks, until the middle of June, for

a succession of bloom. Set the bulb from two to four inches deep, according to the size (we have found deep planting advantageous in dry seasons); and cover lightly with pulverized soil free from stones, pressing it gently down with the palm of the hand. The plants will appear in about ten days, and only require to be kept free from weeds: a light hoeing occasionally is beneficial for keeping the ground open, and allowing air and moisture to penetrate. Do not water, unless in very severe drought, when the plants are dying (except in the case of small bulbs, which are often lost by drying up). Watering tends to bring both new bulbs and roots to the surface, and is injurious.

When the plants are about four inches high, they should each be tied to a neat, light stake, which should be of such a height as to allow the whole bloom of the spike to project above it: two feet six inches is a good length. As the plant grows and the flower-spike pushes, new ties should be given, as much danger is to be apprehended from violent winds or heavy rains. If we do not desire to save seed, we should cut off the flower-stalk as soon as the bloom is past. When the frost has killed the leaves, or before, if the leaves, by turning yellow, show the ripening of the bulb, the bulb should be taken up, dried *rapidly* in full sunlight, the new

bulbs separated from the old, and the flowering bulbs (the stalk being cut off about an inch from the crown of the bulb) and the bulblets (which on some varieties are plentifully produced) put up in paper-bags carefully labelled. During the winter, the bulbs should be preserved in a dry, cool cellar free from frost.

SOIL.

A rich light soil is best adapted to the plant. Our practice has been to dig into the beds late in the autumn a quantity of well-rotted (at least two years') manure (cow-manure is preferable to any other); then in the spring, just before planting, dig the bed again, and pulverize the soil well. In a deep clayey loam with clay subsoil, the plants seldom produce fine flowers. A gravel subsoil seems to suit the plant. Our finest beds are where was formerly a pitch-pine wood.

SEED.

Most of the hybrids ripen seed freely; but no dependence can be placed upon its producing the parent: indeed, for it to do so is the exception, and not the rule. As soon as the seed is ripe, which is known by the bursting of the capsule, it should be gathered, and may at once be sown in a frame

or greenhouse, or carefully dried and preserved until the spring. The seed retains its germinating property about a year.

SEEDLINGS.

Almost every seed will produce a plant. If sown as soon as ripe, say in September, the plants soon appear, looking like small blades of grass: they should be rapidly grown in heat. About the first of March, they will die down: rest should be given them, by withholding water, until about the first of June. The little bulblets, which will be about the size of peas, should then be replanted, in boxes, about three-quarters of an inch apart: water moderately. They will grow all summer, dying down about October: give a rest until January; then repot, an inch apart, and grow until March; rest again until June; plant in beds of finely pulverized soil in the open air, and the larger proportion will bloom in September.

This rapid growth can be attained only where there are greenhouse facilities. Ordinarily, the seed is sown in a box or pot, set in a frame in the spring: the plants die down in the autumn; are wintered in the box in the cellar; the next spring, are planted in a prepared bed; and, following the same process, bloom the third year.

PRESERVATION OF VARIETIES.

As a bulb worth five dollars cannot, in the dry state, be distinguished from one worth five cents, great care must be taken to preserve varieties true to the name. For this, the use of wooden labels, with the name written in black-lead, is to be discouraged, as, aside from the danger of misplacing, the name is often rendered illegible by the weather. We have as yet seen no better way than our own, by which we have preserved some hundreds of distinct varieties without a mistake. The names are written with chemical ink on both sides of a zinc label (such as are ordinarily sold for fruit-trees) : these are attached to chestnut-stakes two and a half feet long, pointed at the lower end, and bored at the upper by a *zinc* wire (iron rusts, lead is too pliable, copper eats the zinc).

In planting, we set the stake with the name attached when we plant the bulb : as the plant grows, it is tied to the stake ; and, in autumn, stake and bulb come up together. When the bulb is dry enough to bag, the name from the stake is first written on the bag ; then the bulb is cut off, cleaned, and bagged, the stalk thrown away, and the stake put away for the next year. All this takes time, and is troublesome ; but

the satisfaction of knowing that all varieties are true to the name more than compensates. If this mode were followed by growers, there would be no such general complaint as now exists, of poor kinds being imposed for good varieties. Our experience is, that, in this respect, the most culpable carelessness prevails, which yearly grows worse as varieties increase.

PROPAGATION BY BULBLETS.

We have said that seeds seldom produce the parent : how, then, can we multiply any variety in quantity ? By bulblets. When we take up the bulb in the autumn, we see at the base of the root more or less numerous bunches of black or white hard bulbs, varying in size from a marble to a mustard-seed. These, if we can get them to grow, produce the original variety. Collect these carefully, bag and label them, and lay them aside for eighteen months ; then sow them in the open border in a prepared bed : they will come up in ten days (not one will fail), and form bulbs which will bloom the next summer. If, however, you plant them the next spring after gathering (instead of keeping them over a season), not one in a hundred will come up.

DISEASES AND ENEMIES.

A cold, damp soil, causing rot, is the greatest difficulty in gladiolus culture: this may be in a degree remedied by planting the bulb in sand. Rust is a disease of which the cause is yet unexplained: the whole plant turns a dirty spotted yellow, and the bulb is found to be eaten with white spots. As soon as the disease is observed, dig up the bulb, and throw it away. It seems more prevalent in damp soils, appearing just as the plant shows bloom. A green cut-worm often eats off the tender shoots in early spring: the only remedy is to examine the base of each shoot at night, and kill the worm. The skin covering the bulb is sometimes infested with mealy-bug: immediately burn every bulb so infested, let the variety be choice as it may.

MULTIPLICATION OF VARIETIES.

This is an evil which will soon be felt. All the world are raising seedling gladioli. At least one-half of the seedlings are equal to or better than old-named varieties. Each grower names his favorites; and we are in danger of having a confusion of synonymes which will rival the palmiest days of pear-culture. How this can be remedied

other than by a gladiolus convention is an interesting question.

We have said our native seedlings are better than named varieties : we have reason to rejoice it is so, and we see no reason for importing gladioli when we can raise far better varieties than we can import.

The following are some of the finest varieties : —

El Dorado, Solfaterre, Lord Campbell, Vulcain, Pluton, La Quintanie, Rembrandt, Madame de Vatry, Goliah, Junon, Vesta, Sulphureus, Hebe, Penelope, Calypso, Madam Binder, Mlle. Souchet, Mrs. Vilmorin, La Poussin, Count de Morny, Achille, Brenchleyensis, Anatole Levanneur, Impératrice, Ceres, Princess Clothilde, Osiris, Dr. Lindley, Napoleon III., Mars.

The following varieties are very poor, and not worth growing, except for massing : —

Mons. Georgeon, Charles Rouillard, Madame Pele, Madame Paillet, Keteleerii, Mrs. Couder, Gil Blas, Roseus, Isabella, Burgraff d'Osterland, Mons. Blouet, Robert Blum, Charles Michel, Dr. Margolin.

These lists might be infinitely increased, and the day is not far distant when a large proportion of imported varieties will be thrown out of cultivation by American seedlings.

THE TIGRIDIA.

This is a beautiful family, consisting of only two species and two varieties. The plants are very tender, being natives of Mexico ; and will not bear the least frost. They need a deep, light, rich soil, free from stones. The bulbs are small, but in growth throw down a fleshy tap-root to a considerable distance. If the ground is not naturally rich, an addition of well-rotted stable-manure will add greatly to the size of the plant and the brilliancy of the flower.

The bulbs should be planted, when the ground gets warm in the spring, in beds or clumps : the plants will soon appear, and bloom in August and September. After the frost has killed the foliage, the bulbs should be taken up, thoroughly dried, and preserved in a warm, dry cellar, out of the way of mice, until time for planting.

They increase rapidly by offsets, and also ripen seed freely.

The flowers are very brilliant, but transient, lasting only one day ; but several are produced from the same stalk.

T. pavonia. — The colors are bright scarlet, spotted with yellow and brown. Introduced in 1796.

T. conchiflora. — Flowers orange-yellow, spotted with brown; not so strong or free-flowering as *T. pavonia*.

T. speciosa is a hybrid between these two, partaking more of the nature of *T. pavonia*, and of a dull, red color.

T. Wheelerii is also a hybrid, resembling *T. conchiflora* more closely.

The plant sometimes seen in florists' catalogues under the name of *T. cærulea* is *Phalocallis plumbea*.

THE WATSONIA.

The plants composing this family were formerly known as gladiolus, to which some of the species are nearly allied. They are rather tall-growing plants, with showy flowers, and of easy culture in light, rich soil. In England they are hardy, and receive the same treatment given to Cape gladioli. With us they require a greenhouse and the usual culture of Cape bulbs. The large-growing species should have large pots, and all require careful attention to drainage. They propagate freely by offsets, and also ripen seed. From some twenty-five species we may name

W. humilis. — A dwarf and very desirable species, with large, rose-colored flowers.

W. Meriana. — A beautiful species, with dark, flesh-colored flowers.

W. fulgida. — A tall-growing, handsome species, with bright-red flowers ; produced abundantly in September.

W. brevifolia. — Flowers bright orange.

W. rosea. — Bright, rosy flowers ; a tall, handsome plant.

W. marginata. — A noble species, with large, salver-shaped, pink flowers. A native of low, sandy hills at the Cape of Good Hope, where it is very abundant.

W. punctata, *plantaginia*, and *spicata* are singular plants, with flowers having little resemblance to the rest of the family.

All the *Watsonias* are subject to the attacks of red spider, which must be carefully guarded against. All are handsome, and should be grown where there is room.

THE SYNNOTIA.

A family of only three species of Cape bulbs, of easy culture in sandy loam, and requiring only the usual culture of Cape bulbs in the greenhouse. They are not handsome enough to be generally cultivated, when we have so many more showy species. The flowers somewhat resemble gladiolus in appearance.

S. variegata. — Flowers dark blue, marked with yellow.

S. bicolor. — Flowers bright yellow, with the superior petal tipped with purple.

S. galatea greatly resembles this.

These plants are also classed with *ixia* and *gladiolus*, and are now generally referred to the latter family.

THE ANOMATHECA.

One of the most sparkling little bulbs for house-culture. The bulbs are small, and should be potted in November, in sandy loam: during the winter they will make a good growth of bright-green foliage, and, beginning to bloom in May, will produce a succession of brilliant, scarlet-crimson flowers all summer. The plants should be allowed to rest from September until the planting season. Propagated by offsets, which are freely produced, and by seeds which bloom the second year, and vegetate without any care.

The species are, —

A. cruenta. — Flowers very brilliant, and the best species. We have grown this species in the open ground; but the flowers are so small, they do not appear as well as in a pot.

A prettier plant for summer decoration of the conservatory it would be difficult to find.

A. juncea. — A free-flowering species, with pink flowers, stained with a dark spot at the base. Very pretty, but not so showy as the last.



THE ANTHOLYZA.

A tall-growing family of Cape bulbs, usually too large for greenhouse culture, and not hardy enough to stand our winters.

The flowers are large, showy, and freely produced. The plants are of easy growth under the ordinary treatment

given to Cape bulbs, and propagate readily by seeds and offsets.

The principal species are, —

A. Æthiopica. — Dark-red flowers.

A. præalata. — Yellowish-orange.

A. montana. — Brown, fragrant flowers. There are other species of no special merit.

A. cunonia, *quadrangularis*, and *splendens* are sometimes called ANISANTHUS.

THE RIGIDELLA.

A beautiful family, with only three species, of which *R. flammea*, which grows about three feet high, with broad-plaited leaves, is the best known. The flowers are dark crimson, very handsome, drooping; but the seed-pod becomes erect after the fading of the flower.

The plant is of easy culture in rich, light soil, and should be treated like a tigridia. It is a native of Mexico, and was introduced in 1838. We have bloomed this plant very successfully in a pot.

The other species are *R. immaculata* and *orthantha*, and are of dwarfer habit.

XIV.

THE AMARYLLIS, HIPPEASTRUM, SPREKELIA, VALLOTA,
LYCORIS, PYROLIRION, NERINE, ZEPHYRANTHES.

THE AMARYLLIS.



WHILE most of the species of this numerous family are greenhouse bulbs, and tender, a few bloom in summer in the garden. We speak popularly, considering all the families of *Hippeastrum*, *Vallota*, *Sprekelia*, as *Amaryllis*, to which family they formerly belonged; but the more recent classifications have left but few true amaryllis, and the old genus has been separated into many new families.

The mode of culture to be pursued with the tender species is given at length in a recent volume of "The Cottage Gardener," from which we quote.

The *Hippeastrums* are, with few exceptions, natives of the tropics ; but, owing to the different elevations at which they are found, some are greenhouse and others stove plants. In their native habitats they are inured to a period of almost continual wet, and undergo a corresponding period of dryness. The heat is most intense when the plants are ripening their bulbs, or at rest ; and least when making their growth, or developing. In cultivation, they require abundant moisture and nourishment when growing ; but, after the foliage has attained to full size, they require no more water than just sufficient to keep the leaves from flagging. Perfect drainage must be secured. The soil should be strong yellow loam and sand. Leaf-mould and other vegetable matter is to be avoided. Too much heat, when growing, is injurious, as it creates drawn foliage, and injures the bulbs. They require as much if not more heat when at rest than when growing ; and, though this may seem the reverse of good management, it is only what they receive in their native habitats. The roots remain on the bulbs throughout the year : taking them out of the pots when at rest, therefore, robs the bulbs of that which Nature has supplied to collect food for the support of the flower-scape.

The practice of taking the bulbs out of the pots, and stor-

ing them near the flues to ripen them, is faulty; for, when potted, the bulbs have immediately to be plunged into bottom-heat, that new roots may be quickly formed to support the flower-stem, as otherwise the flowers fail to expand.

Deep, narrow pots, eight inches in depth, and double the diameter of the bulbs, are the best pots to grow them in.

Frequent potting and plenty of pot-room are not necessary; and potting a plant because the pot is full of roots will frequently prevent its flowering. The pot can never be too full of roots, as the bulbs flower all the better for being cramped: and as long as the drainage is perfect, and the soil is sweet, it is immaterial how long the plants are kept in the same soil and pots; only the offsets should be removed to prevent them from weakening the parent.

The bulbs should be potted as soon as received in a compost of old, turfy, yellow loam, not sifted, but lumpy; add to this one-sixth of sharp sand, and in this pot the bulbs, the neck being level with the top of the pot, and the soil carefully put round the sides and pressed gently down, leaving a hollow of half an inch at the top of the pot for watering, the bulb being covered to the neck with soil. Finish with a copious watering.

This same method is to be pursued in transplanting, taking care not to injure the roots. Perfect drainage must be secured both in potting and repotting.

The newly received bulbs, having been potted, should be placed in a hot-bed, under a flue or any dry place where the temperature will vary little from 50°. Let them remain for about six weeks, and receive no water after potting until the leaves appear. They should then be plunged into a hot bed of about 70° temperature. The bulbs will soon show the leaves and flower-scape, when they must be slightly watered, gradually increasing the quantity as growth progresses.

In a few weeks the plants will be in flower, when they may be removed to the parlor or conservatory. After the bloom is over, remove them to the greenhouse, and keep them duly supplied with water and liquid manure until the strongest growth is attained, which will be in July if the bulbs have been potted in January, which is the most suitable time. Then place the bulbs on a shelf near the glass, in full sun, and gradually diminish the supply of water so as to have them at rest by the beginning of October. They may then be stored away in the pots near the flue so as not to roast them, and no more water be given.

Some of them need no hot-bed treatment; for example, *Sprekelia (Amaryllis) formosissimus*, the well-known Jacobean lily, and *Hippeastrum vittatum*: these do well in ordinary greenhouse treatment, and are among the handsomest of the family. The great rule to be remembered in amaryllis-growing is never to water the bulbs until they show signs of growth, unless they are plunged in bottom-heat, but allow them a natural season of rest. They will begin growing when they are ready; and watering before the leaves appear helps to produce decay in the bulb, and destroys the roots. No set time can be given for starting amaryllis into growth, or for repotting them. The bulbs do not all start into growth at once, nor do all grow equally. Some are late, some are early; but, when the leaves cease to elongate, the growth has been made. In general, the plants start into growth in January, and attain their full growth, and need repotting, in July; but they never need potting while the drainage is perfect and the soil is sweet. After potting, the plants should be kept on a shady shelf for a few days, to recover from the check produced by the operation: they may then be removed to the shelf in the greenhouse, near the glass, and treated as before directed. The care to be taken is that the green foliage does not flag

for want of water. Any bulbs which seem disposed to remain evergreen should not be forced into rest by withholding water; but just enough should be given, and very little will be required, to prevent the leaves from flagging.

The temperature from January to June should be 55° to 60° , and, if plenty of air is given, may rise from 75° to 80° in the sun. From June to October, from 60° to 65° , and rising from 80° to 90° , will do no harm. From October to January, a dry atmosphere, never below 50° , or exceeding 60° , suits them.

It not unfrequently happens, when the growth is made early, say by May, and water gradually withheld after that time, that the plants will rest at midsummer, lose a number of leaves, and give a fine bloom in autumn, in addition to flowering in spring. Any bulbs which seem disposed to rest at midsummer should be encouraged to do so, and water withheld, as continued waterings would only produce a weak second growth.

Plants flowering twice will make a second growth after the second flowering, which must be well supported by waterings of liquid manure, and abundance of water, until perfected; when the bulbs may be dried off, as before

directed. This treatment is proper for most of the family. Any peculiar mode of culture required by any species will be noticed in the description of that species.

Seed may be sown, as soon as it is ripe, in a mixture of dry loam and leaf-mould. Place a seed in the centre of a very small pot, and just cover it with sand. If the sowing is in spring, or before June, place in a hot-bed, with a heat of 70°, and keep moderately moist. When the seedlings appear above the soil, water more abundantly, and keep them growing as long as they seem disposed. They may be kept evergreen for a couple of years, allowing only a season of rest by giving less water when they seem least disposed to grow. After the second season, they should be treated as old plants; and the greater part will flower the third year. Seed sown in autumn should be kept on a dry shelf until spring, and then started into growth in heat, as above.

The following are species:—

Hippeastrum aulicum. — Green and scarlet; Brazil.

H. aulicum platypetalum. — Orange; Brazil.

H. aulicum glaucophyllum. — Crimson and green; Brazil.

H. psitticinum. — Green and red; Brazil.

H. solandræflorum. — White; Guiana.

Var. *rubro-striatum*. — White and red.

Var. *purpurascens*. — White and purple.

H. calyptratum. — Green and red ; Brazil.

H. stylosum. — Coppery orange.

H. reginæ. — Scarlet and green.

H. reticulatum. — Purplish-red ; Brazil.

Var. *striatifolium*. — Purple ; Brazil.

H. crocatum. — Saffron ; Brazil.

H. equestre. — Scarlet ; West Indies.

Var. *major*. — Scarlet ; West Indies.

Var. *plenum*. — Scarlet ; West Indies.

H. fulgidum. — Orange-scarlet ; Brazil.

H. ignescens. — Bright orange.

H. rutilum. — Scarlet.

H. vittatum. — White and red, striped ; Cape of Good Hope.

Var. *majus*. — White and red, striped ; Cape of Good Hope.

H. ambiguum longiflorum. — White and red ; Lima.

H. anomalum. — Crimson and green.

H. Organense. — Crimson and white ; Brazil.

H. pulverulentum. — Orange ; Brazil.

H. princeps. — Scarlet ; Brazil.

The following are fine hybrid varieties :—

H. Ackermanni. — Crimson, two flowers on a scape. The variety *pulcherrima* has larger flowers, and four on a scape.

H. Johnsoni. — Scarlet and white, a cross between *reginæ* and *vittatum*. The variety *striata* has clearer stripes.

H. brilliant. — Scarlet.

H. delicata. — A stripe down centre of the leaf; flowers scarlet and white.

H. Cleopatra. — Dark red, edged with white.

H. marginata conspicua. — White, with crimson stripes; one of the best.

H. Prince of Orange. — Bright orange.

H. ignea. — Brilliant scarlet.

H. crocea grandiflora. — Orange-scarlet, marked with white.

AMARYLLIS BELLADONNA. — This exquisite species is a native of the Cape. Its culture is very easy, if care be taken to grow the foliage well. It thrives well under the general treatment given above; but will also bloom in the border in the summer, if planted in June. The lovely spike of flowers shoots up in August, followed by the leaves. As, however, the foliage has no time to ripen before cut down by the frost, it is well to plunge it in the border in a pot;

and, before the first frost, remove the pot to the greenhouse to mature the leaves, as, otherwise, the bulb will not flower the second year.

A. blanda. — A finer and larger species, but more tender, requiring greenhouse culture, as we have directed above. Flowers delicate blush-white; a native of the Cape.

A. pallida and *latifolia* are varieties of *A. Belladonna*.

THE SPREKELIA.

Sprekelia (Amaryllis) formosissimus. — A lovely species, very different in form from the remainder of the family. The flowers are most brilliant scarlet, and are produced before the leaves. The bulbs of this species may be planted in the open border in May. They will bloom in June, and before October ripen their growth; when they may be taken up, and hung up in a frost-proof, dry cellar, until spring. They may also be grown in pots, in water, or in moss. The plant is generally known as Jacobean lily.

THE VALLOTA.

Vallota (amaryllis) purpurea. — This species is evergreen; and, as its flowers and leaves are seen together, it is one of the most ornamental plants of the family. It is a native

of the Cape, and is found in wet situations. The plants grow freely in sandy peat and leaf-mould, and require plenty of water. The offsets are produced so freely as almost to choke the parent plant. The flowers are brilliant scarlet, and are produced in great profusion in summer. The usual treatment is to grow the bulb all the time, only giving rather less water in winter.

This species is very common, and not unfrequently seen growing in old bowls and pitchers in cottage-windows.

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THE LYCORIS.

A very pretty family, nearly allied to *Nerine*, but natives of China. All the species grow well in light, sandy soil.

L. aurea has bright-yellow flowers in August.

L. radiata has dingy-pink flowers in June, and is a shy bloomer.

L. straminea has striped flowers in June.

All need greenhouse culture, and to be treated like Cape bulbs.

THE PYROLIRION.

A family of two species of rare bulbs, with tubular flowers, resembling zephyranthes; natives of Peru; flowering in summer before the leaves are fully grown, and requiring

rest from December to April. Soil, a sandy loam and leaf-mould.

The species are *P. aureum* and *flavum*, with orange and yellow flowers respectively.

THE NERINE.

The general rule in the growth of this splendid genus is briefly laid down by Mr. Herbert: "To promote the flowering of the nerines, a vigorous growth of leaf must be encouraged in the autumn: the requisites are warmth enough to excite them, and air enough to prevent their growing weak. During the winter, they must not be allowed to lose their foliage either by frost or drought. About May, they should be allowed to rest by ceasing to water them. After about three months' rest, they may be watered again to promote their growth at the very beginning of September." When we add to this, that all the species require a light, sandy soil, we have given full directions for the culture of the nerine.

The flowers of many of the species are very beautiful; but many have the fault of blooming before the leaves.

Most are natives of the Cape; but the Guernsey lily

comes from Japan originally, and *N. undulata* from China.

None of the species are hardy with us, but require greenhouse protection.

N. sarniensis. — This is the Guernsey lily so common in England, producing its heads of red flowers before the leaves. The bulbs are usually imported, just as they are coming into bloom, from the Isle of Guernsey, where they are grown in great quantities.

By growing the foliage well, the bulb will flower again in a year or two; but, in England, it is generally thrown away after blooming.

N. rosea. — A fine species, with pink flowers.

N. curvifolia. — A fine plant, with brilliant scarlet flowers. This species flowers freely, and may be forced into bloom any month in the year, although it naturally blooms in September.

N. corusca. — A species producing large heads of salmon-colored flowers, but not very free-flowering.

N. venusta. — A species much resembling *N. sarniensis*, but producing leaves and flowers at the same time, and blooming earlier than other species.

N. flexuosa. — A species with pink flowers.

N. humilis. — A species with pink flowers and of low growth.

All the species, of which there are ten, deserve more attention than they receive from amateurs. They seed freely, and cross with each other; but hybrids have not been produced between them and any other of the Amaryllis family.



THE ZEPHYRANTHES.

A pretty genus, of which some species are common in greenhouses. The flowers are delicately colored, and pro-

duced one on a stem, but in great profusion. A turfy loam, mixed with a half of pure sand, will grow them well. They flower during the summer, and may be dried off in winter by being placed on a shelf under the stage.

They increase rapidly by offsets, and in time will so fill the pot as to burst it to pieces.

There are ten species, of which the most common are

Z. rosea. — A native of Cuba, very ornamental from the profusion of rosy flowers produced all summer.

Z. Atamasco. — A lovely species; a native of Virginia, where it is called the Atamasco lily, producing rosy flowers, which, with age, turn to pure white, in spring.

Z. candida. — A species with white flowers, much resembling a white crocus. The leaves are flat and fleshy, and both leaves and flowers are very showy.

It is a native of Buenos Ayres, blooming with us all summer.

The other species, of which we may mention *Z. carinata*, *verecunda*, *tubespata*, and *mesochloa*, are all pretty.

XV.

THE TUBEROSE, CYCLAMEN, DAHLIA, COMMELINA, AND VARIOUS TUBERS.

THE TUBEROSE.



WHILE generally called a bulb, the tuberose is properly a tuber ; but this and some other plants of similar nature may well find a place in the present volume.

There are two species of tuberose, — that commonly grown, *Polianthes tuberosa*, a native of the East Indies, and its double variety, much more common but no handsomer than the single ; and *P. gracilis*, a native of Brazil, with light yellow flowers.

The whole secret of blooming the tuberose successfully is in giving the *roots* plenty to feed upon, and in *keeping them*

warm. The ordinary culture keeps the tops warm, and is successful in producing a great amount of foliage.

The tuberose of the garden is a native of the East Indies, and was introduced about 1630. Our dried roots are annually imported from Italy, where they are grown in great quantities for exportation. The day is probably not far distant when we shall be able to grow tuberoses in this country: the experiment has been successfully tried in New Jersey, and bulbs quite as good as any imported have been produced, some of which are now flowering finely in our garden, with as stout spikes and as large flowers as the imported bulbs beside them.

The bulbs for blooming should be carefully selected; those being chosen which are full and plump, and with a sound heart. Pot them in eight-inch pots, singly, in a compost of well-rotted manure or the remnants of an old hot-bed, sandy peat and loam or leaf-mould, with a little charcoal dust; leaving only the crown of the bulb above the soil. Before filling in the compost, place a crock over the hole on the bottom of the pot, and crumble it quarter full of old cow-droppings which have been exposed to the winter in the pasture.

All offsets should be removed previous to planting.

Plunge the pots to their rims in a hotbed ; and, having given a good watering, cover up the frames with the sash, and cover the sash with a shutter. Examine them daily to see that the heat is not too violent ; 75° to 80° is sufficient : but they will not need any water until they begin to grow, which will be in a few days. After they are fairly in growth, remove the lights in fine weather, and give all the sun and air possible ; but, in cold or frosty weather, keep the sashes on.

The first planting should be about the middle of April ; and plantings may be made for succession, at intervals of a fortnight, up to the first of June. As the plants grow, increase the water ; and, as summer advances, remove the sashes entirely : the object is to get as sturdy a growth as possible. There is no danger that a tuberose will not be tall enough. Keep them in the pots, and keep the pots together in the hotbed, until the spikes begin to expand their flowers, when the pots may be removed to the piazza or parlor, or plunged in the garden.

In choosing the position for the hotbed, let it be in full sunshine, and in the hottest possible place. If you supply plenty of water, you cannot get a situation too hot ; but the pots must always be shaded from the sun, which, if kept in

the hotbed, they are sure to be. By pursuing this treatment, the flowers will begin to expand about the middle of July, and continue until the first of November, or later, if housed on the approach of frosty weather. The foliage of the plant, if propagation is an object, should never be touched by the frost; and, in winter, the bulbs should be kept in a warm, dry cellar. Propagation is effected by means of offsets, which are freely produced, and should be planted in spring, in rich, light soil, in a sunny exposure. Flowers may be expected from them the third year.

THE CYCLAMEN.

There is no more ornamental plant for greenhouse or parlor culture than the cyclamen. It grows readily, flowers freely; the foliage is neat, the flowers handsome, and last long in perfection; and, with all these merits, it has no faults. From being long utterly neglected, the cyclamen has recently attracted much attention in England: fine new hybrids have been produced, and the horticultural journals have been filled with reports of cyclamen culture.

The cyclamen thrives well in a soil composed of equal parts of turfy loam, peat, leaf-mould, and silver-sand, well

mixed together, and not sifted. The autumn-blooming species, such as *Europæum*, should be potted in August; the winter-flowering, in September or October. The pots used should be three times the diameter of the bulb, well drained, and filled with the compost; so that the crown of the bulb, when planted, will be level with the rim of the pot, leaving about half an inch all around for watering. Water slightly, to settle the soil; and plunge the pots in coal-ashes, in a cold frame, shading from the sun. Keep them thus, with but little water, till growth begins; then give more water, and plenty of light and air, covering them carefully when the nights become cold. They may be grown in frames until the approach of very cold weather, when they may be removed to the parlor or to the greenhouse; in either case, being placed in situations where they may receive all possible supplies of light and air, and very near the glass. The temperature should not be much higher than 50° until they begin to bloom; the secret of cyclamen culture being light, air, and a low temperature. In England, they are kept in frames all winter, being only removed to the house when about to bloom; but the severity of our winters would probably render such culture unsuccessful in New England, as the plants might damp off when

shut up for many days in succession, as they might be during a continuance of cold weather. When the foliage begins to decay, water should be withheld, and discontinued altogether after a few weeks. The pots may then be placed in a cool, dry situation, out of direct sunshine, where they can have pure air; but the soil should never be allowed to become dry as dust, or the bulb to shrivel. Some cultivators bury the bulb in the pot in the open ground; and, when uncovered in the autumn, the bulb is plump and fresh.

The cyclamen is propagated by seed. The root is a solid corm, and cannot be successfully divided; and the plants sometimes obtained by taking off the little crowns of old bulbs are seldom strong and healthy. The seed should be gathered as soon as ripe, dried, and sown in February, in shallow pots or pans, rather thinly, in a compost of peat, loam, and sand, and the pans be placed in a cold frame, or on a shelf in the greenhouse, near the glass. The plants soon appear, and make a leaf and a bulb as large as a small pea the first year. In spring, turn them out of the pots into a shady place in the garden, and let them remain until September. Then pot each separately in small pots, in a compost of turfy loam, leaf-mould, and

silver-sand, placing the little bulb about half above the soil. Place the pots on a light, airy shelf in the greenhouse, watering moderately during the winter, and taking care that the soil does not become sodden. Continue this culture year by year, accommodating the size of the pots to that of the bulbs. Seedlings bloom the third year.

C. coum. — Leaves bright green, with red on the under-side; flowers bright red, produced external to the leaves, to which they form a margin. A native of the south of Europe, blooming in February and March, but sometimes earlier. It has no fragrance.

C. Neapolitanum. — Flowers red, or rosy pink, blooming from October to Christmas, and succeeded by the foliage. It goes to rest in April and May. A variety, *album*, has white flowers. Neither is fragrant.

C. Europæum. — A species with very variable foliage. The leaves are heart-shaped, sometimes roundish, but never as round as *C. coum*; sometimes beautifully marbled. In one variety they are very large, and the plant is almost an evergreen and continuous blooming. The bulbs are knotty and irregular, but sometimes round, smooth, and flat. The flowers are red, rose, or pure white, deliciously fragrant, and produced in August.

C. repandum.—This species resembles *C. Neapolitanum*, but blooms in spring, showing bright rose-flowers in April. It blooms later than any other species.

C. vernalum.—This species resembles *C. coum*, but is larger in every way: the flowers have a decided purple shade, and the leaves a white marking. It blooms in November, and continues in bloom until February or March.

C. Atkinsi.—A hybrid, between *C. coum* and *C. Persicum*. The leaves are large, often two and a half to three inches by two to two and a half inches; deep, glossy-green, with a pale zone within the margin; the under-side a dull reddish-purple. The flowers are white, with crimson eye: there are many varieties of all shades of white and red. The flowers expand from January to April, and are scentless.

C. Africanum is *C. Neapolitanum*, with larger foliage.

C. Ibericum has flat, heart-shaped leaves, deep green, with gray band, and reddish-purple underneath. Flowers pale rose, with a tinge of purple, with deep crimson spot at base of the segments, extending through to the mouth. Blooms in November, or through the winter, according to treatment.

C. Persicum.—Leaves variously heart-shaped, toothed at the edge; deep green, with gray or white marbling, and pale flesh-color on the under-side. Flowers on tall stalks, white, blotched with crimson at the base, petals very long. It flowers in autumn, winter, or spring, according to treatment. The varieties are, —

C. Persicum rubrum.—Purplish crimson.

C. Persicum purpureum.—Purplish red.

C. Persicum stellatum.—White, with starry spots on each petal.

C. Persicum delicatum.—White, pink centre.

C. Persicum album.—Pure white.

C. Persicum roseum.—Rosy red.

C. Persicum roseum coccineum.—Rose, scarlet centre.

C. Persicum odoratum.—White, rose-eye, fragrant.

C. Persicum odoratum rubrum.—Rosy red, fragrant.

C. Persicum striatum.—Striped and spotted rose, on white ground.

C. Persicum marginatum.—Shaded rose.

There are many other varieties, as seedlings vary very much; but those above given are the most distinct. The above list has been condensed from a carefully written

article in an English magazine, which is the most satisfactory statement of species we have seen.

The frame culture of cyclamen is worth a trial in this country. How charming it would be, if, as in England, we could grow cyclamen like Neapolitan violets!

THE DAHLIA.

This is still in England one of the most popular florists' flowers, though in this country the hollyhock and gladiolus have drawn away many of its admirers. The plant is a native of Mexico; and the original species, which are single-rayed flowers, were introduced into cultivation about the beginning of the present century.

These are, however, long lost to cultivation, unless they exist in botanic gardens; and indeed, though rather pretty and curious, are not, as species, especially desirable. The chief species are *D. scapigera*, *crocata*, *frustranea*, *excelsa*, *lutea*, *superflua*, and *Barkeriæ*; and from these the florists' flowers of the present day have sprung.

The dahlia thrives best in a rich, deep, friable soil, which should be trenched, and well manured with thoroughly decomposed manure. The plants should be set out in the latter

part of May, five feet apart every way ; and, as they grow, be tied to tall stakes.

The best flowers will be produced in September, after the nights become cool. After the frost has killed the tops, the tubers should be taken up, and stored in dry sand until spring.

The dahlia is propagated by cuttings of the young spring shoots, which may be taken off and rooted in a frame in spring, or by division of the roots ; every eye, with a portion of root attached, making a plant. It may also be raised from seed sown in April, in small pots, and the seedlings transplanted.

The characteristics of a good dahlia as a florist's flower are, —

1. The flower should be a perfect circle when viewed in front ; the petals should be broad at the ends, smooth at the edges, thick in substance, perfectly free from indenture or point, and stiff to hold their form ; the flower should cup a little, but not enough to show the under-surface. They should be in regular rows, forming an outline of a perfect circle, without any vacancy between them ; and all in the circle should be the same size, uniformly opened to the same shape, and not crumpled.

2. The flower should form two-thirds of a ball when looked at sideways. The row of petals should rise, one above another, symmetrically: every petal should cover the joining of the two petals under it, — what the florists call *imbricating*, — by which means the circular appearance is perfected throughout.

3. The centre should be perfect: the unbloomed petals, lying with their points towards the centre, should form a button, and should be the highest part of the flower, completing the ball.

4. The flower should be symmetrical. The petals should open boldly, without showing their under-side, even when half opened; and should form circular rows, uniformly laid, evenly opened, and enlarging by degrees to the outer row of all.

5. The flowers should be very double. The rows of petals lying one above another should cover one another very nearly: not more should be seen in depth than half the breadth. The more they are covered, so as to leave them distinct, the better in that respect: the petals, therefore, though cupped, must be shallow.

6. The size of the flower when well grown should be four inches in diameter, and not more than six.

7. The color should be dense, whatever it be ; not as if it were a white dipped in color, but as if the whole flower was colored throughout. Whether tipped or edged, it must be free from splashes or blotches, or indefinite marks of any kind ; and new flowers, unless they are superior to all old ones of the same color, or are of a novel color themselves, with a majority of the points of excellence, should be rejected.

As in dahlias the newest varieties are supposed to be the best, and as each year gives us many new varieties, the best list can be obtained from florists' latest catalogues.

THE COMMELINA.

These pretty little plants are natives of America ; and some have tuberous roots, which are eatable.

They should be raised from seed from which they bloom the first year. When the frost has killed the foliage, the roots should be taken up, preserved in dry sand until spring in a frost-proof cellar, and planted out like any tender tuber.

The species are, —

C. cælestis. — Flowers blue or white.

C. communis. — Flowers bluish purple.

C. tuberosa. — Flowers blue.

There are many other species, mostly with blue flowers.

SALVIA.

One species of the salvia, *S. patens*, has a tuberous root. The seeds should be sown in the greenhouse or a frame in April, and the plants pricked out into the garden, where they bloom the first year. On the approach of cold weather, they should be taken up, and treated as directed for comeline.

ASCLEPIAS.

One species of the silkworts, or milkweeds, is a hardy tuber.

Asclepias tuberosa is one of the most showy plants in the garden in July. The flowers are deep orange. The plant is hardy, and, once well established, will bloom freely for years. It delights in a rich, deep, light soil, in which the roots strike to a great depth.

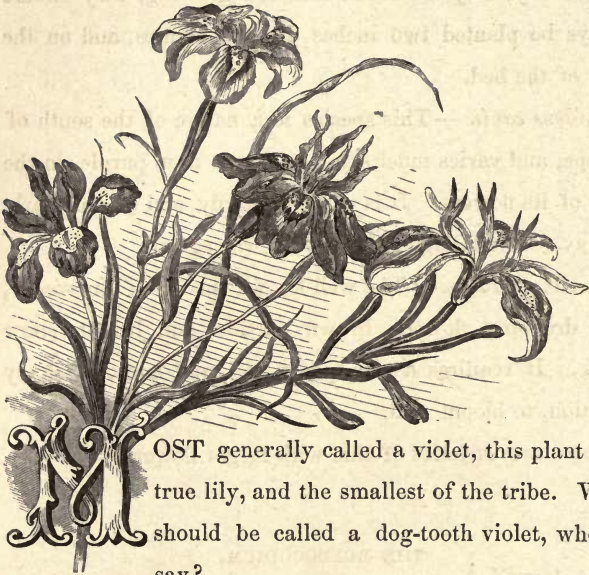
APIOS.

A. tuberosa is a pretty, pea-like vine, with hard tuberous roots, commonly known as "ground-nuts." The plant is

climbing, and in August produces large clusters of deliciously fragrant, reddish-purple flowers.

A native of North America, and not uncommon in shady thickets ; perfectly hardy ; and, once planted in good soil, it will take care of itself.





NOST generally called a violet, this plant * is a true lily, and the smallest of the tribe. Why it should be called a dog-tooth violet, who can say?

All the species are natives of Europe and America, and delight in a soil containing an abundance of decaying vegetable matter. All bloom in very early spring, and have ornamental foliage. The bulbs are very impatient of drought, and, when transplanted, should be kept as short a time as possible out of the ground. The best time for transplanting is just after the foliage has died away, which will

* *Erythronium*.

be in June ; but the plants should seldom be disturbed. As, individually, they are small and low-growing, they should always be planted two inches deep, in clumps, and on the front of the bed.

E. dens canis.—This species is a native of the south of Europe, and varies much, from white to deep purple, in the color of its flowers. It is perfectly hardy, and blooms early in May. The foliage is beautifully variegated.

E. Americanum.—The well-known species of our woods, with drooping flowers, brown outside, and bright-yellow inside. It requires a rich, peaty soil, and a moist, shady situation, to bloom well.

There are varieties of this with larger flowers.

THE BULBOCODIUM.

A pretty little plant, greatly resembling a crocus, and thriving and flowering well in the spring border under the same treatment.

The species are *B. vernum*, *Caucasicum*, and *versicolor*, all spring-flowering and perfectly hardy. *B. Caucasicum* is sometimes called MERENDERA CAUCASICA.

THE COLCHICUM.

All plants of this family resemble the crocus, and are commonly known as autumnal crocus, or meadow saffron. The botanical difference consists in the crocus having three stamens, and the colchicum six; the colchicum also producing many more flowers from the same bulb.

All the family are natives of Europe or Asia. These plants need only to be planted in common garden-loam, where they increase very rapidly, and flower freely. All are perfectly hardy. The peculiarity of the plant is its producing its flower in the autumn, and throwing up the foliage and ripening its seed in the next spring.

C. autumnale. — A pretty species, throwing some six or eight flowers from each bulb in November. The flowers are purple, and there are white and double varieties.

C. Byzantinum. — A native of Turkey, with large bulbs, — each producing sixteen to twenty flowers in autumn, — succeeded by the leaves in May. The flowers are purple.

There are other species; but they are seldom cultivated, though perfectly hardy.

THE ERANTHES.

The winter aconite (*Erantes hyemalis*) is a simple little yellow flower, valuable for its early blooming, and contrasting well with the snowdrops, which are the only flowers to keep it company at the early season at which it blooms.

The flower is about three inches high, produced one on each of a pair of flat-lobed leaves, which terminate the stalk. The root is tuberous, and resembles a lump of hard peat-earth.

It needs only to be planted in the border, and left to itself. It is a native of England. There is another species, a native of Siberia (*E. Siberica*), also with yellow flowers, and equally hardy.

THE TROPÆOLUM.

The tuberous species of this family bear little resemblance to our common nasturtiums. They are generally tender greenhouse-plants, of delicate growth, and proper subjects for careful culture. They are natives of South America; and one, *T. azureum*, has flowers of the finest blue in the floral kingdom.

The tubers should be potted when the thread-like stem is

seen starting from the top of the bulb, in rich, sandy loam, in not over-large pots. The plants should be given plenty of sun and air, and the hair-like stems daily twined round a trellis. After the bloom has faded, the foliage turns yellow, and the root should be allowed to rest. Growth generally begins in autumn; and the plant flowers in early spring, resting in summer. The chief species are, —

T. brachyceras. — Flowers yellow.

T. Jarattii. — Flowers scarlet and yellow.

T. azureum. — Flowers blue.

T. tricolorum. — Flowers orange, red, and purple. These are among the most graceful plants in the greenhouse; free-growers, with high-colored and very curious flowers, and, in *T. azureum*, delightfully fragrant. Trained round a balloon-trellis, they make fine specimens. A singular fact in their growth is, that the stem, which, where it joins the bulb, is as fine as a hair, is often found to increase in size in its growth, and, in a distance of several feet, may be three or four times larger.

THE OPERANTHUS.

This little bulb is often found in florists' catalogues under the name of *Amaryllis lutea*. It is also called yellow colchi-

cum. The flower resembles a yellow crocus, and is produced in October; the foliage continuing to grow during the winter.

In England it is hardy, and contrasts well with beds of colchicum; but it does not stand our winters, and therefore must be grown in a pot in the greenhouse. Soil, common loam.

The species is *O. luteus*, a native of Tangiers; and there is a variety with narrow leaves.

THE MUSCARI.

These plants, commonly known as musk or grape hyacinths, are common in every garden. They require no particular culture, and increase and flower well year after year. As they are rather dwarf, they should be planted in the front of the flower-border. They propagate freely by offsets or seeds.

M. moschatum. — This, the common musk-hyacinth, is readily known by the strong smell of musk. The flowers are purple when they expand, but gradually become yellowish. A native of Turkey.

M. macrocarpum. — A more showy plant than the last, and easily known by its large size and brilliant colors.

M. comosum. — The well-known tufted hyacinth, of easy

culture in common garden-soil. The feathered hyacinth is a variety of this species.

M. botryoides. — This is the best known and finest of the family. The flower-spikes look like little bunches of grapes ; whence the name of the family. From their peculiar fragrance, the plant is often called “Baby’s Breath.”

There are light and dark blue, and an almost black variety ; also a white one, which is very pretty, and, it is said, a pink one. A native of Italy, and perfectly hardy.



THE LACHENALIA.

A family of Cape bulbs, of easy culture in the green-

house, under the usual treatment of Cape bulbs. They require a sandy soil, and are often, when well grown, ornamental; but the plants are small, and make but little show. The foliage of some of the species is prettily variegated.

There are twenty or thirty species, all flowering in spring or winter, of which the best are

L. pendula. — Scarlet and green flowers.

L. quadricolor. — Scarlet and green.

L. luteola. — Yellow.

L. tricolor. — Red, green, and yellow.

L. unifolia. — Green.

L. anguinea. — White, variegated foliage.

L. purpureo cœrulea. — Blue and purple.

THE STERNBERGIA.

A family of autumn-blooming bulbs, with yellow flowers, produced, one on a stalk, before the leaves. They grow and flower freely in sandy loam, but are not very ornamental. Treatment the same as for *Operanthus*. The species are *S. colchiciflora* and *Clusiana*, both with yellow flowers; the former a native of the Crimea, the latter of Turkey.

XVII.

THE ARUM, CALOCASIA, ERYTHRINA, CANNA, DICENTRA,
SANGUINARIA, RICHARDIA, TRILLIUM.

THE ARUM.



MOST of the plants of this family are more curious than beautiful; but the foliage is generally effective, and the flowers, from their peculiar appearance, are worthy of a place in a large collection.

Some plants once classed with this genus have been separated to form a new family called ARISÆMA, and some of the large stove species are now known as ALOCASIA and CALOCASIA. There are about a dozen hardy, and some twenty greenhouse or stove species. They all thrive in

sandy loam, with a portion of peat ; and are propagated by division, and rarely by seed. The plants begin to grow in the spring, when they should be repotted : in the autumn they rest, and should be allowed to dry off, but never to become very dry. Some of the stove species, however, are evergreen.

A. dracunculus is very showy when in bloom.

The most common species are, —

A. (Arisæma) dracontium. — The common green-dragon, with tall, hand-shaped leaves, and bright-green flowers. A native of North America, and hardy in any damp garden-soil.

A. dracunculus. — The well-known dragon-plant, growing several feet high, with a large, blackish-purple flower. This species may be potted in autumn, and will bloom in spring : it should have a rather large pot. With us it requires greenhouse protection. It is sometimes grown as a house-plant ; but its rank smell does not recommend it for the parlor.

A. italicum. — A small-growing species, with greenish-yellow flowers, requiring greenhouse treatment with us, and not very ornamental.

A. tenuifolium. — Also a low-growing species, with white

flowers ; a native of the south of Europe, and requiring the same treatment as *A. Italicum*.

A. (Arisæum) triphyllum. — The common Indian turnip, or Jack in the Pulpit, of our woods. The plant is curious and ornamental, both in flower and berry. It thrives well in deep soil, in a shady situation, and often grows very large.

The stove species are seldom seen in collection.

THE CALOCASIA.

These plants have been separated from arum. They are generally distinguished for their large leaves, and are grown as foliaged plants. They require stove treatment. Most of the species are evergreen ; but some of the deciduous kinds do well in the border as bedding-out plants, and the foliage is very ornamental.

C. esculenta. — This is a fine aroideous plant, throwing up from a flat root, with a prominent tubercle on the top, a crown of dark, rich green foliage. While in the greenhouse, it will preserve its foliage most of the year : it does well in the border as a bedding-plant. The tubers should be planted in the latter part of May, in a rich soil, in a sunny situation, about six inches deep. They will soon make

growth; and, by the 1st of August, the plant will have a crown of rich foliage, some of the leaves being two feet long. If the roots are forwarded in pots, plunged in a gentle hotbed, the plants become effective in the garden by the 1st of July. As an ornament for the border of ponds, this is a splendid plant.

The soil must be deep, rich, and rather moist, for the full growth of the foliage. In autumn, take up the roots, dry and clean them, and keep them in dry sand, in a frost-proof cellar, until spring.

C. odorata. — This is a stove species, with noble foliage and very fragrant flowers. The plant is evergreen and caulescent, growing from three to six feet in height. The flower is large, greenish yellow, and delightfully fragrant. The plant requires plenty of room for its roots and leaves; and, where sufficient space can be given, it is a noble plant.

THE ERYTHRINA.

A most showy family of plants, which, usually grown with stove-heat, do well bedded out in the summer.

Most of the family are natives of the tropics, and are rapid-growing plants, with pinnate leaves, and pea-like flowers of bright or dark red.

The shoots proceed from a hard, woody root, in early spring; grow rapidly, producing large spikes of bloom in August; and, if allowed, will continue growing until the plant becomes a shrub, or even a small tree. The proper treatment, however, is to cut off all shoots close to the root, and allow the plant to rest during the winter, starting it into growth again in early spring.

The plant is singularly facile in its growth; for by proper application of heat, light, and water, it may be had in bloom any month in the year.

Our plan is to treat it as a bedding-plant.

In April, the roots are planted in a frame, where they soon make shoots.

When all danger of frost is over, and the chill is out of the ground, the roots are carefully transplanted to a rich border, where they grow vigorously, and bloom freely all summer. When the frost has killed the foliage, the plant is cut down; and the roots, packed in dry earth, are preserved in a warm frost-proof cellar until spring.

The flowers of all are red, dark or dull, or scarlet; the difference being in color, foliage, and growth. The plants are easily propagated by cuttings of the young shoots in spring, or by cutting up the old flowering stem when ripe, and strik-

ing the cuttings in sand under a bell-glass, with strong bottom-heat. Seed is also occasionally produced, and vegetates freely. Within the last few years, the French florists have raised some fine hybrid varieties, with very brilliant flowers ; but they are not yet in general cultivation.

The principal species are *L. laurifolia*, *crista galli*, *herbacea*, *speciosa*, and *macrophylla*.

THE CANNA.

These plants, commonly known as Indian shot, are very conspicuous in the garden as foliaged plants, and some of the flowers possess no inconsiderable degree of beauty. Raised from seed, which should be sown in pots, with gentle bottom-heat, the plants make but little show the first year ; but when the roots are large, and the plants become strong, there is no more effective plant in the garden.

The object should be to encourage the growth of the seedling-plants by pricking them out in rich deep soil in order that the roots may become large. After the frost has killed the tops, the roots should be carefully lifted, and, with what little soil adheres to them, placed in flat boxes, and kept in a dry, frost-proof cellar until spring. In April, place the

roots in a cold frame from which frost is excluded, covering them with a slight coating of loam, and water them. They will soon begin to grow ; when they may be divided into as many parts as there are shoots, and, in the latter part of May, should be transplanted to the borders. They are very effective in large beds, as the contrasts of the leaves of the different species and their beautiful markings are very fine. The flowers are red, yellow, crimson, or scarlet, in long spikes. Some species grow six to eight feet long.

C. Nepalensis, *viridiflora*, *gigantea*, *limbata*, and *Warszewiczii* are fine species. For a long list of species, with height and color of flowers, see "Garden Flowers."

THE DICENTRA.

These plants, of which the best-known species is the well-known *D. (Dielytra) spectabilis*, are hardy ornaments of the herbaceous border. There are many species, mostly with fleshy or bulbous roots. Some of our native species, as *D. cucullaria* and *Canadensis*, are very ornamental, and do well in a shady situation, in rich soil. *D. spectabilis* requires only the treatment of common border-plants. If, however, the plants are allowed to get very large, they decay in the

centre : therefore they should be taken up and divided every third year. The plant seeds sparingly, but may be increased largely by division. There is a white variety. The European bulbous or rather tuberous species are not very ornamental or desirable.

THE SANGUINARIA.

This well-known flower, the bloodroot of our woods, springs from a thick, creeping root-stock.

The flower is white, with a mass of yellow stamens in the centre, and blooms in early spring ; the flower bud coming up enveloped in a sheathing-leaf, which, after the fading of the flower, becomes very large. The plant grows readily in the border. We have a semi-double chance variety, and have little doubt but that a double variety might be produced. *S. Canadensis* is the only species.

THE RICHARDIA,

Formerly known as the calla, but now as *R. Æthiopica* : this plant is one of the best parlor-plants we have.

Its growth is stately ; the flower showy, fragrant, and freely produced ; and it seems to defy all the injuries which gas and furnace-heat inflict upon other plants.

The root is a flattish tuber, and resembles that of other aroideous plants. The only requisites for successful culture are rich soil, plenty of water, and pot-room.

It propagates freely by suckers, which should be removed if a single large plant is the object ; but the better plan is to keep repotting as the old pot fills with roots, and allowing all the suckers to remain : a very large plant will be the result, which will never be out of bloom.

As a bedding-plant in the summer, the calla does well, producing fine, healthy foliage, but not flowering freely. In water-scenery, its foliage is very effective.

There is a variety, with foliage spotted with white, which may be desirable in a collection of foliaged plants.

The plant is a native of Africa, and is killed by the least frost.

THE TRILLIUM.

These plants are natives of rich woods, but grow well in the garden, if in deep soil, and not in a very dry situation. They are among the most beautiful of spring-blooming plants, and nothing can exceed the beauty of a large bed of *T. grandiflorum* in full bloom. The corm is small, roundish, and seamed, and generally deep in the ground.

All are perfectly hardy. They are propagated by division or by seed, which vegetates with difficulty, and may be transplanted either in early spring, before blooming, or in autumn, when the foliage decays. The fruit is a red or purple berry. All are natives of North America. The species are, —

T. cernuum. — Flower white, green, and purple centre, nodding, and hidden beneath the leaves; the least handsome species, but very easily grown.

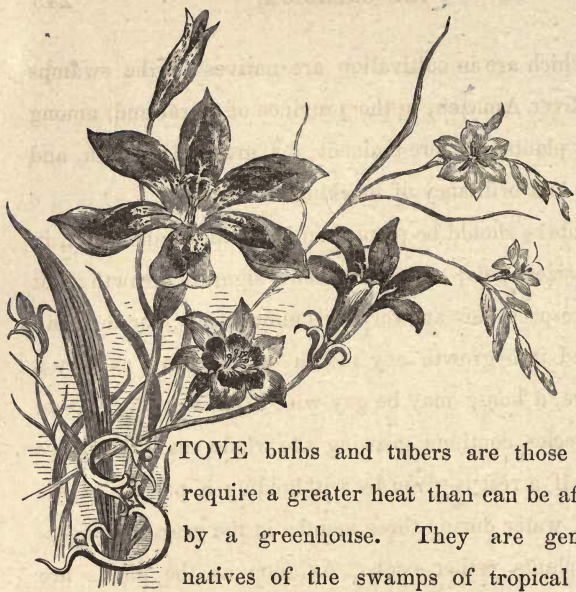
T. sessile. — A low-growing species, with dark-reddish flowers and variegated foliage.

T. pictum or *erythrocarpum*. — Flower white, with lake centre. Rather difficult to cultivate; does best in moist peat-soil.

T. grandiflorum. — A noble species, with large white flowers, changing to rose-color.

T. erectum. — Flowers brownish purple, and with a disagreeable odor.

There are also other species.



STOVE bulbs and tubers are those which require a greater heat than can be afforded by a greenhouse. They are generally natives of the swamps of tropical countries. During growth, they require heat and moisture, and, if deciduous, a rest when the leaves begin to turn yellow at a temperature not lower than 60° ; or, if evergreen, to have only just water enough to prevent the leaves from flagging.

In the present volume, we propose only to describe a few of those most commonly cultivated.

THE CALADIUM.

These bulbs were formerly considered arums; the earliest known being, even now, commonly called *arum bicolor*.

Those which are in cultivation are natives of the swamps of the River Amazon, in the province of Pará, and, among foliaged plants, are pre-eminent for graceful growth, and elegance and brilliancy of marking.

The tubers should be planted in peaty loam and sand, in medium-sized pots, when they show signs of growth: but in this respect they are very accommodating; for they can be started into growth any month in the year; and, by a little care, a house may be gay with caladia at any season. Some species continue growing the whole year; but these do better if a rest is given by withholding a portion of the supply of water during three months in the year, and keeping the plants rather cool. As soon as the plants are potted, they should be set in a warm place, or, if possible, plunged in a bark-bed, near the flue, to give them a little bottom-heat, in order to obtain large roots before the tops begin to grow. When the leaves once start, the plants should be kept in the warm end of the house, and plenty of water should be given. Indeed, the foliage grows larger, and is more highly colored, if the pots are set in pans of water, and every thing done to encourage large growth; for, as the beauty of the plant is the foliage, it should be well grown. The flowers are poor, and not ornamental: there-

fore, as soon as flower-buds appear, they should be picked off. The plants should always be sheltered from the direct rays of the sun.

The foot-stalks of some of these plants are sometimes three feet long; and the leaves nearly a foot long, and eight inches wide. When the plants show a disposition to dry off, reduce the supply of water, and, if all the leaves die, for a time discontinue watering altogether, and let the plant dry off; but never keep it during rest in a temperature lower than 60° to 65° : the tubers should never become quite dry. If the leaves should not all die away, it is best to give a little water occasionally, and keep up a weak growth for a while; and, after the season of rest, the plant will throw up stronger foliage. If the temperature is too low, and the soil wet, the tubers become of a pasty, soapy consistency, and perish. All the species are easily propagated by dividing the roots just as growth begins. The following are fine varieties:—

C. Surinamense.—Dark-green leaves, spotted with white.

C. marmoratum.—Dark green, marbled with cloudy white; grows all the year, and a small plant soon makes a specimen.

C. pictum. — Leaves large and broad, spotted with pure white spots.

C. hæmatostigma. — Leaves dark green, with transparent, red-and-white spots, and very slightly tinged with red in the centre.

C. Humboldtii. — Leaves covered with patches and spots of transparent white.

C. pellucidum. — Dark green, the ends of the veins touched with purple. Transparent white spots, with a touch of red in the centre.

C. argyritis. — Dark-green leaf, marbled and spotted with snowy white, so that the ground-color can hardly be seen. A dwarf species, producing an abundance of foliage.

C. Chantinii. — Leaves large, the veins and midrib of intense red, shading to pink; the dark-green of the leaf blotched with rosy-white spots; the border of the leaf pale, yellowish green.

C. Neumanii. — Dark-green leaf, with numerous irregularly scattered spots of clear rose.

C. Brougniartii. — Leaves rich, velvety green, glaucous on the under-side; leaf-nerves very large, clear red. A lovely species.

C. argyrosphilum. — Shining green, spotted with irregular blotches of pure white, with crimson centre.

C. Verschaffeltii. — Dark green, with rich vermilion spots.

C. Houletii. — Pale-green leaf, white nerves, marked at the centre with faint red spots.

C. subrotundum. — Shining green, with crimson lines and veins.

C. hastatum. — Leaf hastate, of dark green, so marked with numerous small white spots as to give it a powdery white appearance ; veins slightly touched with red.

C. picturatum. — Leaf green, the veins beautifully bordered with vivid rose.

C. Barraquinii. — Leaf all red, with a narrow border of green. A very fine species.

C. bicolor. — The oldest species ; leaf green, with red veins and centre.

C. atropurpurea. — A tall species ; leaf-stalks dark purple ; leaves dark, blackish green.

C. Bellemeyii. — Dark green, marbled with dazzling white.

C. poecile. — A pretty species, with neat foliage, but with no vivid markings.

There are many others which might be mentioned, and some very rare, new varieties ; but a selection from those above enumerated cannot fail to give satisfaction.

THE CRINUM.

A large family of amaryllis-like plants, with large foliage and showy flowers. All of them delight in rich soil, and require plenty of water when growing. The bulbs are generally large, and require plenty of pot-room. The species cross freely, and many fine hybrids have been introduced. Most of the species are stove bulbs ; though some thrive under greenhouse culture, requiring the treatment given to Cape bulbs.

C. australe. — Flowers white ; a greenhouse species, requiring rest for six months in the year.

C. flaccidum much resembles a white lily.

C. Capense. — One of the hardiest of the family, which may be treated as a Cape bulb : it should have plenty of water while growing.

C. amabile. — A large but very fine species, requiring stove culture, and flowering in spring and fall. The flowers are dark rose-color, fragrant, and are produced on an immense spike. The plant is evergreen.

C. erubescens. — A stove species, with pale-white flowers in July.

There are some dozen varieties.

All the family are ornamental, and will repay cultivation.

THE CLIVEA.

A splendid flowering bulb, nearly related to amaryllis, from the Cape of Good Hope. It should be potted in rich sandy loam; have a high temperature and plenty of water while growing, and less water and a lower temperature when at rest. A good plan is to grow it in the stove, and rest it in the greenhouse. The plant is evergreen, and is difficult to flower. The flowers are red and yellow, very showy; produced on a spike two feet high in July.

C. nobilis is the only species.

THE EUCHARIS.

This splendid plant is of recent introduction. It is a thick-leaved, evergreen, bulbous plant, of the amaryllis tribe; a native of Grenada; requiring stove treatment, but

very free-flowering. The proper soil is fibry loam and a little peat.

After potting, say in early winter, plunge the pot in a slight bottom-heat in the stove, say at 70° to 75° , to start it into vigorous growth, giving plenty of water. When the growth is perfected, remove the plant to the greenhouse, and give it all the sun possible until September. Then diminish water to hasten the ripening, and by the end of the month remove to a cool stove where the temperature is from 50° to 55° ; giving only enough water to keep the plant healthy.

It may be forced into bloom at any season. The flowers are pure white, large, and showy, on foot-stalks just above the leaves. The plant will grow, and we have bloomed it, in the greenhouse; but it does better in the stove.

E. Amazonica, or *grandiflora*, is the species, and is a native of South America. It is one of the finest of the amaryllis family; and has the merit, which so few have, of blooming with, and the flower seeming to conform to, the foliage.

THE GRIFFINIA.

A genus of stove-bulbs, from South America, which thrive well with the general treatment of amaryllis.

The soil should be peat and loam, with a little sand and leaf-mould.

In growth, the plants should be kept at a temperature of 60° to 80°, and have plenty of water ; but, when at rest, the heat should never exceed 50°.

Propagated by offsets and by seeds, which may be treated as other seeds of the amaryllis family.

There are but three species, —

G. hyacinthina. — Flowers blue and white.

G. parviflora. — Pale-purple flowers.

G. intermedia. — Blue flowers.



THE CYRTANTHUS.

The plants of this family differ widely from each other,

and are generally of difficult culture. A greenhouse is too cold for them, and a stove too close.

They should be potted in strong, friable loam; have greenhouse culture from April to November, and an airy situation in the stove from December to April. The deciduous species should be kept dry in winter.

C. obliquus and *carneus* are evergreen; the remainder are deciduous.

There are eight species, all natives of the Cape. *C. obliquus*, when it can be flowered, is very showy.

THE HÆMANTHUS.

Stove-bulbs, but flowering in the greenhouse; growing freely in sandy loam and peat; natives of the Cape of Good Hope. The bulbs are large, and flower in autumn, just before beginning to grow. The flower is very showy, but by no means handsome. The leaves are two, very large, and grow all winter. When the leaves wither, the plant should go to rest, and remain until August; when it may be repotted.

H. coccineus is the most common species, and there are about twenty others.

THE BRUNSVIGIA.

A family of Cape bulbs, generally requiring stove heat.

They are allied to amaryllis, and do well under the same treatment. The soil may be loam and peat. They need a season of perfect rest, which should be given in winter. They flower from June to September, according to the species. The flowers are large and showy; but, the bulbs of many species being very large, the plants occupy more room than can be afforded, except in a large collection.

B. grandiflora and *Josephinæ* are very fine species.

There are about a dozen species.

B. falcata and *Coranica* are also called AMMOCHARIS, and may be grown in a greenhouse, as they are hardier than the other species.

THE EUCOMIS.

These are large Cape bulbs, which bloom well both in the greenhouse and the stove. The flowers are coarse, and not very handsome; of a green color, but fragrant.

They thrive with common treatment, resting in summer. They bloom in early spring. There are five or six species, none very desirable.

XIX.

ACHIMENES, GLOXINIAS, GESNERA.



UNDER the head of Bulbs, we could hardly treat of these plants ; but, as we have given ourselves more latitude, we may include them : and, for the decoration of the greenhouse or conservatory in summer, there are no plants so suitable as the subjects of the present chapter. For ease of culture, beauty of growth, and delicacy of bloom, they are unsurpassed ; and they also remain a long time in perfection, so that the greenhouse may be gay with them from June to October.

ACHIMENES.

This plant, though properly to be grown in a stove, does well in the greenhouse in summer. The bulbs are small,

varying in shape in the different species. Early in February, the bulbs should be turned out of the old soil, and carefully planted, about half an inch deep, in a compost of decomposed peat, silver-sand, and leaf-mould. After a gentle watering to settle the soil, the pans should be placed in gentle bottom-heat, or over the flue in the stove, where the temperature will be about 75° . Here they may remain until the shoots are an inch high. Another mode is to start the plants thickly in large pans, in bottom-heat, and, when the plants are an inch high, to transplant them to the blooming pans; the advantage of which is, that no bulbs fail to come, and you can so arrange the sizes by planting the larger in the middle, and the smaller round the side of the pan, as to form a mass of foliage and bloom. The plants should then be placed in a house where the temperature at night does not fall below 60° , and near the glass, that they may grow sturdy. Let the soil be kept damp, but not wet, and syringe occasionally. Should the sun cause them to droop, shade a little at noon. When the plants are about five inches high, they should be tied to neat stakes, which should be as small as possible, and painted green. Fill up the pots (which should not, till now,

be quite full of soil) with a compost of loam, well decomposed cow-dung, and silver-sand.

In tying the plants, care should be taken to so place the stakes, and tie the plants, that the whole pan may be a symmetrical mass of green.

The plants will bloom by the middle of June ; when they may be removed to the conservatory, and shaded, that the flowers may last longer. As soon as the bloom opens, all syringing should be stopped.

Plants potted a month later will succeed these in bloom ; and, by a succession of pottings, the stage may be filled with achimenes until wanted for winter-plants.

If the air of the house where they are grown is kept moist, there will be no danger from red spider or thrips ; and a gentle fumigation will destroy green aphids, if they attack the plants.

After blooming, the plants should still be exposed to the light, but should have less water ; and, when the leaves turn yellow, the stalks may be cut off, and the pans placed in a dry place where the temperature is about 45° : if upon a damp floor, all the better, as thus the bulbs keep plump. It is a bad practice to dry them too much, or to take them out of the soil and put them away in paper-bags.

Some of the best kinds are, —

A. coccinea. — An old but good species, with bright-scarlet flowers.

A. longiflora, and varieties *major* and *alba*. — Large blue or white flowers.

A. Meteor. — Crimson-scarlet, yellow eye.

A. Dr. Hoff. — White, rosy, lilac centre.

A. Baumannii hirsuta. — Violet-purple.

A. Ignea. — Bright scarlet.

A. carminata splendens. — Brilliant carmine.

A. picta. — Yellow and scarlet, spotted leaves.

A. Margaretta. — White.

A. Ambroise Verschaffelt. — White, marked with violet.

A. rosea elegans. — Bright rose.

A. Sir Traherne Thomas. — Rosy carmine.

A. picturata. — Rose, with dark spots.

A. Parsonsii. — Salmon-crimson, orange centre.

GLOXINIAS.

A family of lovely plants, from South America. The original species have been lost in the multitude of fine hybrids which have mostly sprung from *G. speciosa*, *maculata*,

and *caulescens*. The bulbs are large, and, in general appearance, resemble a cyclamen. They should be potted, one in a pot, in good turfy loam and leaf-mould, with a liberal admixture of well-rotted, rather dry cow-manure and silver-sand; the whole well mixed, but not very fine. The crown of the bulb should be just covered with soil, which should not be pressed in too close.

Pot as soon as the bulb shows signs of growth, but not earlier than January. Treat them as recommended for achimenes until the pots are filled with roots; then repot in a larger size, and continue the treatment until they flower. When in bloom, remove them to the conservatory, and treat as achimenes until the time for repotting.

They may be propagated by seed, by cuttings, by leaves, or by dividing the root in spring.

By cutting a leaf up, and placing it in moist sand, every part will make a small bulb; or the leaf may be planted entire, inserting it an inch or so in the sand. This latter method makes very strong plants.

Seeds may be sown at any time; but the spring is the best season. The soil should be light and rich; and, as the seed is small, it can hardly be too lightly covered. Place the pans in a frame, keeping the surface of the soil damp,

and the plants will appear in about ten days. As soon as large enough, they may be pricked off into pans, and, in due time, into separate pots. If kept in a moderate heat, they will retain their leaves most of the winter ; and, if well grown, will bloom the next season. The flowers are either erect or drooping. Those marked with a * are erect.

The following list is of fine kinds : —

G. alba sanguinea. — White, carmine throat.

G. alba grandiflora. — Pure white.

G. Princesse de Lambelle. — Bright red, white throat.

G. Carlo Maratti. — White and violet-blue ; fine variegated leaves.

* *G. Donna Colonna*. — White, violet rose.

G. Cartoni. — Carmine and pink.

G. Dr. Lindley. — White, and pale blue.

G. Wilsonii. — White and carmine.

G. Fifyana. — White and purple.

G. Maria Van Houtte. — White, pink, and lemon.

G. Tarragona. — Rich crimson and white.

G. Fulgens. — Rose tube, with crimson.

G. Princess Royal. — White, mottled-blue throat.

G. Lady K. Hamilton. — Tube and throat crimson, shading to rose.

* *G. Guido Reni*. — White, crimson centre.

G. Sir Hugo. — Violet-purple.

The characteristics of a good gloxinia are, the plant should be healthy and vigorous, with sufficient foliage to cover the top of the pot. The leaves should be broad, thick, and velvety; the lower ones growing in a horizontal manner.

In drooping varieties, the tube of the flower should be broad and stout; the throat should be wide and even; the sepals slightly reflexed, smooth and round at the edges, and of sufficient substance to retain their beauty. The color, if a self, should be bright and distinct; if spotted, splashed, or striped, the markings should be very decided, and not run together. The greater the contrast of colors, the better; the markings to be regular; the three under-sepals should always be marked alike, and of uniform size.

The plant must be a free-bloomer, the flowers standing well up above the leaves; and as the front, or inside, of the flower is the handsomest part, it should be the most conspicuous.

The erect varieties should have a long, round tube, a little swelled at the middle; the throat to be the same color

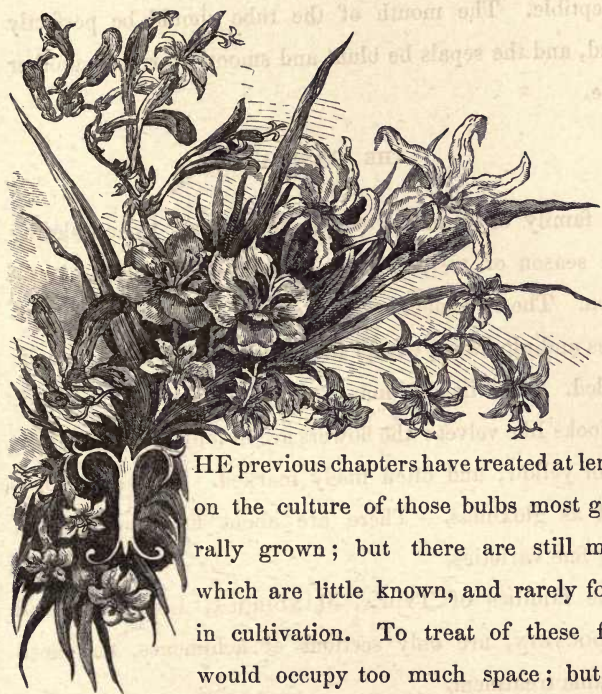
all round, the sepals the same, and the divisions scarcely perceptible. The mouth of the tube should be perfectly round, and the sepals be blunt and smooth, forming another circle.

THE GESNERA.

A family of beautiful stove-plants, that, by regulating their season of rest, may be brought into bloom at any season. The treatment is the same as prescribed for achimenes and gloxinias, except that much syringing should be avoided. The foliage of many species is beautifully marked, and looks like velvet: the flowers are in long spikes, scarlet, red, or yellow, and often finely marked. They are propagated as gloxinias. There are about fifty species, and many fine varieties.

The families of TYDEA, MANDIROLA, LOCHIERA, and SCIADOCALYX, are only sections of achimenes, and need the same treatment.





THE previous chapters have treated at length on the culture of those bulbs most generally grown ; but there are still many which are little known, and rarely found in cultivation. To treat of these fully would occupy too much space ; but our work would be manifestly incomplete did we fail to mention them. A large proportion of them have never been in cultivation in this country ; and some are known in England only by descriptions of specimens once in cultivation, but now lost. Of some we can speak fully, having grown and

flowered them; but of others can only copy the description offered us in botanical works or horticultural serials.

There are some bulbs which we have omitted entirely, because, in many cases, their identity is difficult to establish, as they are lost to cultivation; and others are so rare, that there is no probability of their ever coming into the possession of any reader of this volume.

PENTLANDIA.

Greenhouse bulbs, from Peru, allied to amaryllis. The flowers are orange-red, pretty, but not remarkably handsome.

The plants grow freely in sandy loam and leaf-mould, and propagate freely by offsets. They bloom during the summer or early autumn. The species are *P. miniata*, *lacunosa*, and *Sullivanica*; the first of which was for a long time in our possession, and flowered freely every year under the ordinary greenhouse treatment of an autumn-flowering bulb.

HOMERIA.

A family of Cape bulbs, worthy of more attention than it receives. They produce an abundance of flowers, which continue a long time in perfection, and are very brilliant. Blooming during the summer, they need not be potted

until March, and require only ordinary greenhouse treatment, — to be potted in peat, leaf-mould, and sand, and freely watered when growing. They multiply very freely from offsets.

H. lineata. — This is the most common species ; the flowers are coppery red, with a metallic lustre, and are produced in great abundance all summer.

We have had this species in bloom from June to September.

H. spicata. — A beautiful species, with orange-yellow flowers.

H. collina. — Orange-scarlet flowers, very freely produced.

H. miniata much resembles *H. lineata* ; but the flowers are darker and smaller.

Other species are *H. aurantiaca* and *ochroleuca*, both with yellow flowers.

HEXAGLOTTIS.

Rather a pretty little yellow-flowering Cape bulb, requiring a sandy soil, and perfect rest when not in growth.

The plant flowers in early spring, and should be allowed to rest after flowering.

The species are *H. flexuosa* and *virgata*.

By many botanists, the family is united to *Moræa*.

TRICHONEMA.

A pretty family of bulbs, with ixia-like flowers; natives of the Cape and of the south of Europe. They require the same general treatment as ixias.

The flowers are red, blue, yellow, purple, or rose, and are produced in spring.

There are about twenty species, of which we may mention .

T. caulescens, *roseum*, *tortuosum*, *speciosum*, and *cruciatum*, from the Cape.

T. bulbocodium, *Columnæ*, and *purpurascens*, from the south of Europe.

T. cælestinum; a native of North America.

GALAXIA.

Small bulbs, from the Cape of Good Hope; generally with large, showy, yellow flowers, and requiring the usual culture of Cape bulbs. Soil sandy peat and loam.

The species are *G. graminea*, *grandiflora*, *mucronularis*, *ovata*, and *versicolor*; all blooming about midsummer.

LAPEYROUSIA.

A family of showy-flowering bulbs from the Cape, called also PEYROUSIA and OVIEDA. They much resemble ixias in their growth and flowers, and require the same general treatment. The plants produce blue, white, violet, or pink flowers in spring.

The species are *L. aculeata*, *silenoides*, *anceps*, *corymbosa*, *fissifolia*, *falcata*, *fasciculata*, *Fabricii*.

HESPERANTHA.

A small-flowering bulb, from the Cape, thriving, in sandy loam and peat, under the culture usually given bulbs of this nature. The flowers are pretty, but not conspicuous. Like most of the Cape bulbs, it propagates freely by offsets.

The species are *H. falcata*, *cinnamomea*, *radiata*, and *angusta*, with white or violet, very fragrant flowers.

WACHENDORFIA.

A family of rather large-growing, free-flowering Cape bulbs, requiring a soil of sandy loam and peat, and to be

treated like ixias. They bloom in summer, and are very showy. *W. brevifolia*, unlike most Cape bulbs, has ever-green leaves, but must, nevertheless, have a season of rest when the season's growth is over, induced by withholding water, but not sufficient to allow the leaves to wither. We have had a very fine show of these flowers in the conservatory in summer. The species are *W. paniculata*, *Herberti*, *graminea*, *tenella*, and *thyrsiflora*, with straw or yellow flowers ; and *brevifolia* and *hirsuta*, with purple-shaded blossoms.

HYPOXIS.

Bulbous plants, with thick underground stems ; natives of every continent except Europe. Some are hardy ; but most of those with ornamental flowers require greenhouse culture in loamy peat.

The flowers of all are starry, mostly yellow ; but a few white and blue.

While not very showy, they are worth growing where there is room.

There are sixteen species, of which *H. linearis*, *stellata*, *elegans*, and *alba* are the best. *H. erecta* is hardy.

COOPERIA.

A North-American family of tender bulbs, with showy flowers expanding at night. The flower-stem is erect and stiff, each bulb producing but one at a time, crowned with a single flower. Soil sandy loam. Propagated by offsets or seeds, which should be sown in spring. The species are, —

C. pedunculata. — With white and yellow flowers.

C. chlorosolen. — White and evergreen.

C. Drummondii. — White and red flowers, natives of Texas and Mexico.

HAYLOCKIA.

A little bulb, allied to Cooperia, with straw-colored flowers, blooming in September, a native of Buenos Ayres, thriving in sandy loam and leaf-mould. The leaves grow all winter, and the plant rests in the spring. Propagated by seeds or offsets. *H. pusilla* is the only species.

ANDROCYMBIUM.

A family of Cape bulbs, with green or white flowers, growing in loam and sand, and propagated by seeds and offsets.

A. eucomioides, *melanthoides*, *volutare*, are the species.

BLANDFORDIA.

A very interesting family of beautiful bulbs, from Australia, requiring to be potted in peat and loam, and to be treated like ixias. Propagated by offsets and seeds. The species are *B. nobilis*, *flammea*, *grandiflora*, *intermedia*, *marginata*, *Cunninghamii*, and *Backhousii*, with red, yellow, crimson, and orange flowers.

BRAVOA.

A little Mexican bulb, allied to amaryllis; flowering in summer in rich light soil. Increased by offsets.

B. geminiflora, with red flowers, which is the only species that has flowered freely with us.

CALOSCORDUM.

A pretty bulb, allied to Milla, thriving in common soil. The flowers are rose and purple.

C. nerinefolium, a native of Chusan, is the only species.

MILLA.

Small bulbs, with beautiful milk-white flowers, growing freely in rich, light soil.

The principal species, *M. biflora*, is a native of Mexico, and is very ornamental. Propagated by offsets.

M. uniflora is known as *Tritelia uniflora*, and is a native of Buenos Ayres.

ELISENA.

A very showy bulb, allied to Pancratium, with large white flowers, resembling an Ismene. Soil very sandy loam; propagated by offsets.

E. longipetala, from Lima, is the only species.

ISMENE.

South-American bulbs, with white and yellow flowers, somewhat resembling a daffodil. They flower in summer, and may be bloomed in the border. They should be planted in pure sand, and treated as directed for sprekelia. If the soil is not sandy, they will not flower. The best way to obtain bulbs would be to send to Peru, where the most common species, *I. Amancæs*, is very abundant, near Lima, There are eight species, of which *I. Amancæs*, *calathina*, and *nutans* are the best.

PANCRACTIUM.

Rather an extensive family of greenhouse and stove bulbs, growing in sandy loam, and propagated by seeds, or spar-

ingly by offsets. The flowers are generally white, fragrant, and showy.

The greenhouse species are *P. Illyricum*, *maritimum*, *rotatum*, and *Carolinianum*, of which the first mentioned might possibly prove hardy.

Of stove species, we may mention *P. Canariense*, *amœnum*, *biflorum*, and *acutifolium*.

CARPODETES.

A Peruvian bulb, with yellowish-purple flowers, growing in sandy loam, enriched with decomposed leaves or well-rotted manure, with good drainage.

C. recurvata is the species.

DAUBENYA.

Yellow-flowering bulbs, from the Cape, thriving in rich sandy loam, and blooming in summer under the usual treatment. *D. aurea* and *fulva* are the species.

CARPOLYSA.

C. spiralis is a pretty little Cape bulb, with pink, starry flowers, requiring the same treatment as an *ixia*.

HABRANTHUS.

A large family of amaryllis-like bulbs, generally natives of South America. The flower-stem is thrown up before the leaves in early autumn, and the leaves grow all winter.

They should be grown in sandy loam and peat, with good drainage, and have perfect rest after the leaves fade.

They propagate by offsets or by seed, which should be sown in spring, and have a gentle bottom-heat to start it into growth. There are about twenty species, and many fine hybrid varieties, of which we may mention *H. Andersoni*, and the varieties *aureus* and *cupreus*, *bifidus*, *Bagnoldi*, *roseus*, *intermedius*, and *kermisianus*.

IXIOLIRION.

Rare and pretty bulbs, natives of Syria and Tartary, with pale-blue flowers. They thrive in common soil, and propagate by seeds or offsets.

I. montanum and *Tartaricum* are the species.

PHYCELLA.

South-American bulbs, with red or scarlet flowers, in summer or early autumn, growing in good loam, with perfect drainage.

They should be planted in February, and taken up and kept dry, like tulips, when the leaves wither.

There are about a dozen species, of which the best are *P. crytanthoides*, *ignea*, *biflora*, *corusca*.

CHLORETIS.

A family separated from CRINUM by Mr. Herbert. *C. glauca* is a native of Mexico, with large white flowers.

It grows in sandy soil, and needs a season of perfect rest. It flowers in August.

STRUMARIA.

This genus requires the same treatment as Nerine, to which it is nearly allied. The bulbs are of low habit, with red, white, or pink flowers, and are natives of the Cape.

Some of the species are *S. truncata*, *undulata*, *geminata*, and *rubella*.

COBURGIA.

A family of South-American, showy, flowering bulbs, growing in sandy loam enriched with leaf-mould. They

may be grown and flowered in the border, like the Jacobean lily (*Sprekelia*). Propagated by offsets.

There are nine species, generally with red or orange flowers, of which *C. incarnata* is the most common.

GASTRONEMA.

A family of two species of small Cape bulbs, with white or rosy flowers, growing in loam and leaf-mould, with the usual culture of Cape bulbs ; flowering in early summer.

The species are *G. sanguineum* and *clavatum*, both very rare.

CHLIDANTHUS.

A pretty bulb, with fragrant yellow flowers ; native of Buenos Ayres. The bulb grows freely in sandy loam, and produces numerous offsets, which should be removed, or the main bulb will not flower. Our bulbs flowered in July. *C. fragrans* is the only species.

URCEOLINA.

A Peruvian bulb, growing in rich loam, and requiring shade ; blooming in summer, and requiring perfect rest in

winter. Propagated by offsets. *U. pendula*, and *aurea*, with yellow, red, and green flowers, are the only species.

STENOMESSION.

Pretty bulbs from South America, with orange, scarlet, and yellow flowers, requiring complete rest in winter, and plenty of moisture in summer, and to be grown in sandy loam. They flower in spring before the leaves grow. There are eight species, all natives of Peru, of which the best are *S. flavum*, *curvidentatum*, *croceum*, *Hartwegii*, *aurantiacum*, and *vitellinum*.

FOURCROYA.

A family of enormous amaryllis-like plants, the stems of *F. longæva* attaining the height of forty feet. They are natives of Mexico, and are seldom found in collections. The species are *F. longæva* and *F. gigantea*.

EUCROSIA.

A pretty bulb, native of the Peruvian Andes, growing in rich, sandy loam. The flowers are bright vermilion; but

the plants, though often grown in the greenhouse, thrive better in a stove. They bloom in spring, and should rest in winter.

E. bicolor is the only species.

CALOSTEMMA.

New-Holland bulbs, of which there are five species, with yellow, purple, or white flowers. They grow in sandy loam, blooming in early summer, and “need abundance of water to make them flower.”

The species are *C. purpureum*, *album*, *luteum*, *carneum*, and *Cunninghamii*.

EURYCLES.

Stove-bulbs, requiring sandy loam and leaf-mould, and rest in winter.

The flowers are white, and produced in May. The species are *E. Amboinensis* and *Australasica*.

GLORIOSA.

A family of bulbs, with climbing stems, allied to the lily. They should be grown in a stove, in a compost of peaty loam and leaf-mould, potted in March, trained to a

trellis as they grow ; and they will bloom in summer. The flowers are yellow or orange, and very showy. Propagated by separating the bulbs. Well-known species are *G. Nepalensis*, *superba*, and *virescens*. They are also known as CLINOSTYLIS.

HYDROTÆNIA.

A half-hardy bulb, “with the aspect of a *Tigridia*, and flowers like a *Frittelaria*.” Grow in light, rich, sandy loam, and treat like a *Tigridia* ; taking it up in autumn, when the leaves are killed.

The species are *H. lobata*, from South America, with yellow and purple flowers ; and *H. meleagris*, with yellow flowers ; a native of Mexico.

HYMENOCALLIS.

A family of some thirty species of greenhouse and stove bulbs, with large amaryllis-like flowers.

They grow in rich, sandy loam, and are propagated by offsets ; blooming in summer.

H. adnata and *rotata* may be grown in the greenhouse.

The flowers of all are white, and resemble those of a *Pancratium*.

GETHYLLIS.

As *Fourcroya* is the largest of the amaryllis, so is *Gethyllis* the smallest.

The species are little bulbs from the Cape, and grow readily in sandy loam and peat. The flowers of all are white, blooming in July; and the plants are about six inches high. Propagated by offsets and seeds. *G. Afra*, *spiralis*, and *ciliatris* are the species most known.

LIDEBOURIA.

A rare bulb from the East Indies, allied to *Bessera*. Soil sandy loam; flowers greenish-white. The only species is *L. hyacinthina*.

VELTHEIMIA.

A family of large Cape bulbs, not very handsome, but effective, and remaining long in blossom. Should be grown in the greenhouse, in sandy loam. The plants rest all summer, but bloom in December and January.

V. viridiflora is the most common species: with us it has ripened seeds freely. The plants rarely make offsets.

V. glauca and *intermedia* are the other species.

CYANELLA.

Small Cape bulbs, with white, blue, yellow, and red flowers, which do well treated like ixias. Some of the species are *C. alba*, *lutea*, *odoratissima*, and *Capensis*. They generally bloom in July and August.

RHINOPETALUM.

A small bulb, with pink-spotted flowers; native of the Ural, flowering in January. Soil sandy peat and loam. *R. Karelini* is the only species.

LIBERTIA.

Pretty little bulbs, with white flowers, allied to VIEUSSEUXIA, blooming in early spring; generally natives of Australia. Soil sandy loam, with a little leaf-mould. The species are *L. formosa*, *grandiflora*, *pulchella*, and *paniculata*.

PHÆDRANASSA.

South-American bulbs, allied to Coburgia, and requiring the same treatment. They may be made to rest either in winter or summer. The species are *P. chloracea* and *obtusa*.

both from Peru, of which the former has produced its crimson flowers in our collection.

BRODLÆA.

Showy bulbs, with blue flowers in summer; natives of the western coast of North America. Grown in sandy peat, they bloom in summer.

B. congesta has bloomed finely with us. The other species are *B. grandiflora* and *Californica*.

MASSONIA.

Small Cape bulbs, of little importance, with white flowers, flourishing in sandy loam and peat. *M. candida*, *grandiflora*, and *violacea* are among the species.

PUSCHKINIA.

A solitary species, with bluish-white flowers, resembling a Scilla; native of Siberia, and hardy on sandy loam. *P. scilloides* is the species.

CALIPRORA.

A little California bulb, with yellow flowers in August, growing in peat. In England it proves hardy, but would probably require protection with us. *C. lutea* is the only species.

CAMASSIA.

A native of the north-western part of America, where it is very common. We have flowered the bulbs in the greenhouse; but they would probably prove hardy planted in spring, and taken up in the autumn. The flowers are purple, produced in July. Soil, sandy peat, and a shady situation. *C. esculenta* is the species.*

MELANTHIUM.

Mostly natives of the Cape of Good Hope. They do well planted in peat and sandy loam, and treated as ixias; generally flowering in spring. *M. junceum* and *uniflorum* are the best known species.

MONTBRETTIA.

A small Cape bulb, with yellow flowers, resembling an ixia, and requiring the same treatment. The species are *M. flexuosa* and *virgata*.

BESSERA.

Mexican bulbs, with beautiful flowers, blooming in September, and requiring a sandy peat soil. Propagated by offsets. The species are *B. elegans*, flowers scarlet; *B. Herberti*, flowers purple and white; *B. fistulosa*, purple.

* See also Scilla.

NECTAROSCORDUM.

A curious bulb, native of Sicily, with long pendulous purple, green, and white flowers. It grows in common light soil, and blooms in June. *N. Siculum* is the only species, and is rare in collections.

CALOCHORTUS.

Very beautiful California bulbs, blooming in summer. Most of the finest species are lost to cultivation, as they are very difficult to grow. It would be difficult to convey an idea of the beauty of the flower. Soil sandy peat.

C. elegans, *luteus*, *nitidus*, *venustus*, *splendens*, and *macrocarpus* are the species. The flowers are white, purple, or yellow.

CYCLOBOTHR.

The flowers of these plants are drooping, and very ornamental. They are, like the last genus, very difficult to cultivate. They bloom in August. Perhaps they might succeed better as bedding-bulbs than in the house.

The species are *C. alba*, white flowers, *pulchella* and *monophylla*, yellow flowers, from California; and *C. lobata*

and *lutea*, also with yellow flowers, and *purpurea*, with green-and-purple flowers, from Mexico. They may be propagated by little bulbs, which are produced on the stem.

PLANTIA.

A little Cape bulb, with yellow flowers, growing in rich, sandy loam, and propagated by offsets or by seeds, which should be started in spring with bottom-heat.

P. flava is the only species.

LEUCOCORYNE.

Very fragrant little South-American bulbs, growing in sandy loam, and blooming in autumn.

The species are *L. alliacea* and *odorata* with white, and *ixioides* with lilac flowers.

BELLEVALIA.

Commonly known as the Roman squill, as it much resembles a *Scilla*. The plants require the treatment of the tender *Scillas*, and bloom in May. *B. operculata*, or *Romana*,

has white flowers ; and *B. Syriaca* has orange-and-blue flowers.

ALBUCA.

A large family of bulbs, with whitish or greenish-yellow flowers of very little beauty ; mostly natives of the Cape. There are some twenty species, which may be grown like ixias ; mostly flowering in spring.

GAGEA.

A family of about twenty species of small bulbs, with yellow flowers. Natives of Europe. All hardy in England, and many of them might stand the winters here. They are not handsome enough for greenhouse culture.

BARNARDIA.

A pretty bulb from China, with pale-blue flowers, requiring the same treatment as a tender SCILLA. The species is *B. scilloides*.

HESPERASCORDIUM.

Pretty plants from California, allied to *allium* ; growing in sandy loam. They bloom in July, and are propagated

290 DRIMEA ; ERIOSPERMUM ; SPATALANTHUS ; ETC.

by offsets or seeds. The species are *H. hyacinthinum* with blue, and *H. lacteum* with white flowers.

DRIMEA.

Not very showy Cape bulbs, requiring the same treatment as ixias ; generally flowering in August. *D. villosa*, *altissima*, and *elata* are the best of a dozen species.

ERIOSPERMUM.

A genus of Cape bulbs, comprising eight species ; flowering before the leaves. The flowers are not ornamental, being generally greenish-white or blue. They grow in sandy peat, and propagate by offsets.

SPATALANTHUS.

A rare and delicate Cape bulb, allied to *Trichonema*. The flowers are red, with a star of yellow and black in the centre. It should be grown in turfy loam, sand, and peat. The species is *S. speciosus* ; but it is a very rare plant even in its native country.

CONANTHERA.

A very rare bulb from Chili, of difficult culture. The plants grow in winter, and rest in summer, flowering in

April. The soil should be sandy, and the pots be well drained. *C. bifolia* and *Simsii* are the two species, both with blue flowers.

CUMMINGIA.

Another South-American genus, not very easy to grow. Soil sandy loam. Propagated by offsets. The family was formerly classed with CONANTHERA. The species are *C. campanulata*, *tenella*, and *trimaculata*; the two former bearing blue flowers in autumn, the latter in December.

UROPETALON.

A genus of plants, with flowers of little beauty, growing in light loam, and propagated by offsets. These plants are only desirable in large collections. *U. serotinum* is a native of Spain. *U. longifolium* is from Mozambique. *U. glaucum*, *fulvum*, and *viride* are from the Cape of Good Hope.

STREPTANTHERA.

A genus of Cape bulbs, with showy flowers, now united to *gladiolus*. *S. cuprea* and *elegans* were the only species.

TRITELIA.

A very pretty family of American bulbs, with blue or white flowers, growing in sandy loam, and blooming in July.

They are very showy plants if well grown, and do well with greenhouse culture.

The species are, —

T. laxa, flowers blue, in large umbels.

T. uniflora, flowers sky-blue. This latter species is a very pretty plant when several bulbs are grown in a pot. It has flowered thus with us very prettily.



They are very showy plants if well grown, and do well with

greenhouse culture.

The species are, —

T. lutea, flowers blue, in large nodules.

T. virginica, flowers white. This latter species is a very

great plant when several bulbs are grown in a pot. It has

flowers thus with its very greatly

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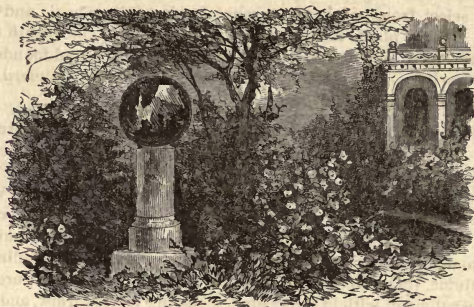
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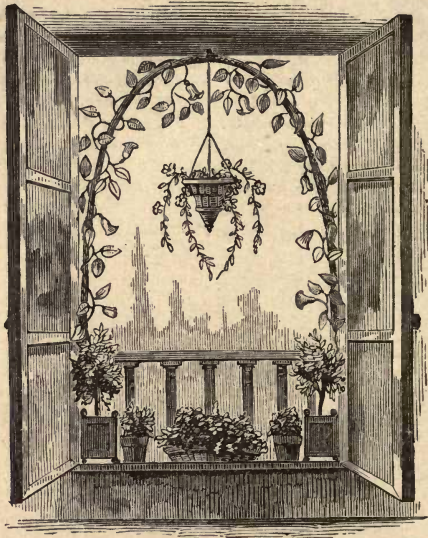
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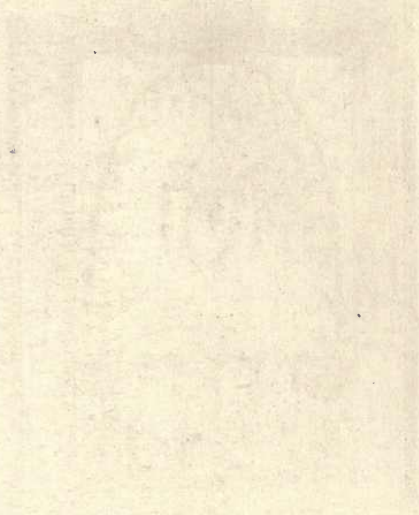


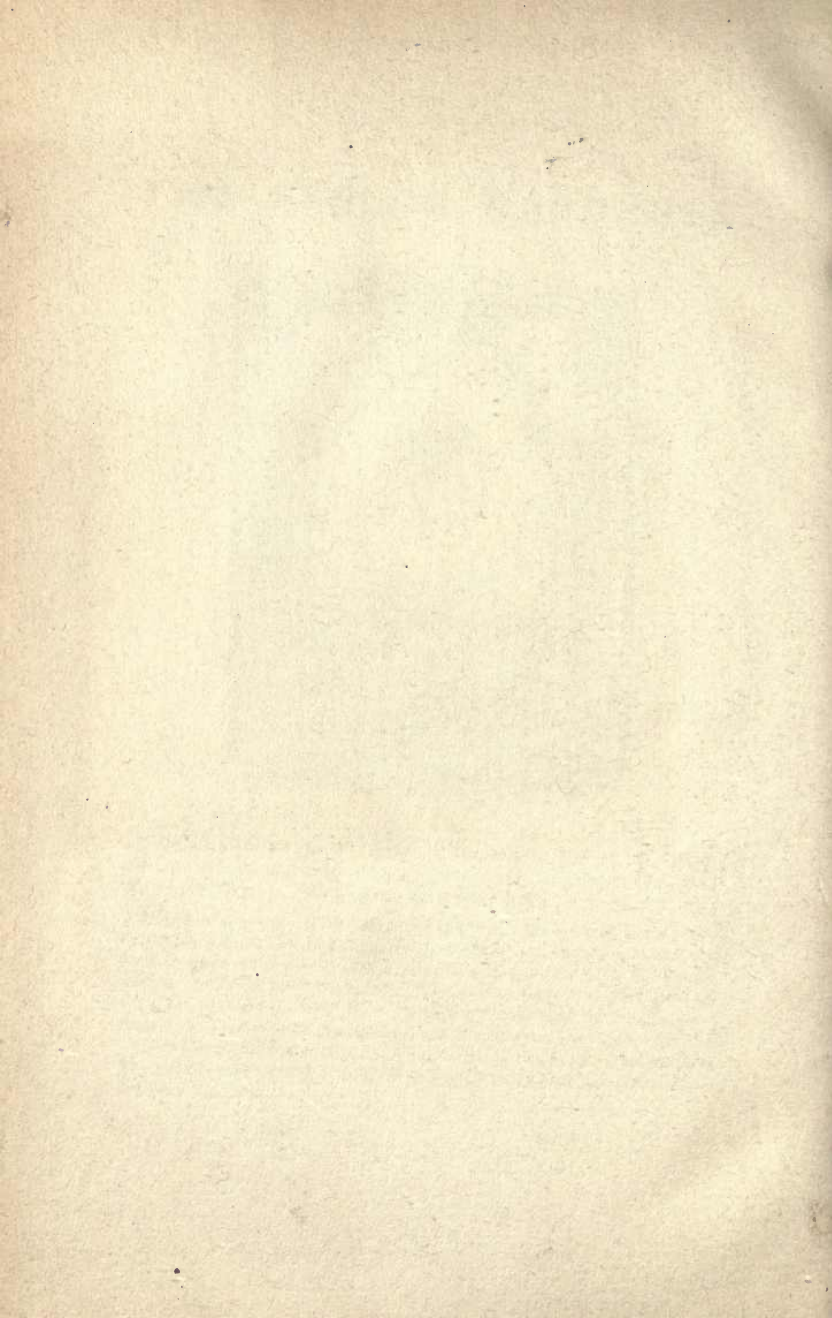
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